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THE OPHTHALMIC RECORD

EDITED BY

CASEY A. WOOD, M. D.
Chicago
G. C. SAVAGE, M. D.
Nashville
GEO. E. DE SCHWEINITZ, M.D.
Philadelphia
JOHN E. WEEKS, M. D.
New York
F. C. HOTZ, M. D.
Chicago
H. V. WÜRDEMANN, M. D.
Milwaukee
W. E. HOPKINS, M. D.
San Francisco
HAROLD GIFFORD, M. D.
Omaha

T. A. WOODRUFF, M. D.
EDITORIAL SECRETARY,
1102 RELIANCE BUILDING, CHICAGO, ILLS.

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The July number of the Ophthalmic Record will contain the report of the Ophthalmic Section of the American Medical Association. An original article by F. C. Hotz, M.D., "Extraction by Electro-Magnet of a small chip of steel through the original corneal wound." One by George E. de Schweinitz, M. D., "A piece of steel in the vitreous located by means of the Roentgen rays, according to Sweet's method; removal with Electro-Magnet."

The Record particularly desires short practical papers on any subject connected with Ophthalmology. These will be published at as early a date as possible. It is understood that, unless otherwise arranged, original articles when accepted are contributed to the Record exclusively. Illustrative cuts will be made at the expense of the journal and proofs for correction will be sent to authors when desired. Reprints with covers are furnished at cost. One hundred of these will be presented to authors *gratis* when a request for them is written on the original manuscript. The Record will be issued monthly and each number will contain about 54 pages of reading matter.

Address all communications relating to Editorial Department to

T. A. WOODRUFF, M.D., Editorial Secretary,
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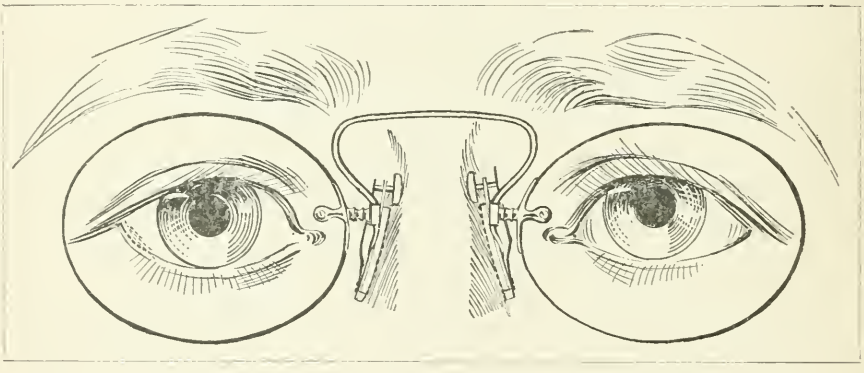

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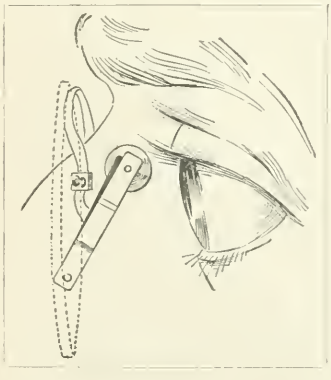

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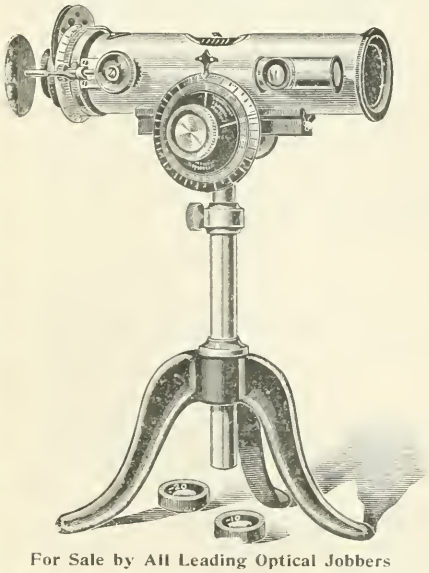

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THE

OPHTHALMIC RECORD

A MONTHLY REVIEW OF THE PROGRESS OF OPHTHALMOLOGY.

VOLUME VII. CHICAGO, JUNE, 1898. No. 6. NEW SERIES

ORIGINAL ARTICLES.

PARTIAL OPTIC NERVE ATROPHY AND CENTRAL SCOTOMAS (SO-CALLED CENTRAL AMBLYOPIA), APPARENTLY DUE TO CHRONIC LEAD POISONING.*

BY G. E. DE SCHWEINITZ, M.D.,

OF PHILADELPHIA.

Illustrated.

The following cases of central amblyopia present certain clinical features of interest, and in one of them lead, so far as chemical tests are concerned, appears to have been the cause of the ocular symptoms:

Thomas Ryan, aged 35, born in England, single, a house-painter, was admitted to the medical wards of the Philadelphia Hospital on the 24th of December, 1897, on account of progressive weakness in the legs, chronic constipation, some cough with expectoration, and dim vision.

History.—The patient suffered from the usual illnesses of childhood. He denies syphilitic infection, but confesses to having had a chancroidal bubo and one attack of gonorrhea. He has been accustomed to drink spirits, and has used tobacco freely, especially by chewing, but had used neither tobacco nor liquor for two months before admission.

The man is a painter by occupation, and has followed that calling for fifteen years. His last work, however, was done five months before he entered the hospital. He has suffered at times from colic, but never typically from painter's colic, nor has he ever had wrist-drop. For the past two years he has been ailing, and for a number of years he has suffered much from persistent constipation, always requiring laxatives to secure a movement of the bowels. About Novem-

*Read before the Ophthalmic Section of the College of Physicians of Philadelphia, April 19, 1898.

ber, 1897, he began to notice that his vision was failing, his attention being first directed to this symptom by his inability to read ordinary print. The failure in vision was unassociated with pain or other sign of inflammatory action.

Examination.—The patient is a somewhat emaciated, pallid man, with purplish eyelids and weak, discouraged voice. There is retraction of the left apex and harsh breathing, but no tubercle bacilli could be found in the sputa.

On admission, it is stated that examination of the urine did not reveal abnormalities, but three months later an examination by the resident, Dr. George M. Purves, gave the following result: Reaction acid; specific gravity 1017; trace of albumin with the nitro-magnesium test; no sugar; microscopically a few pale, granular casts and bladder epithelium.

There is no special disturbance of the mental faculties, except that the patient is rather slow in answering questions, this slowness being apparently due more to

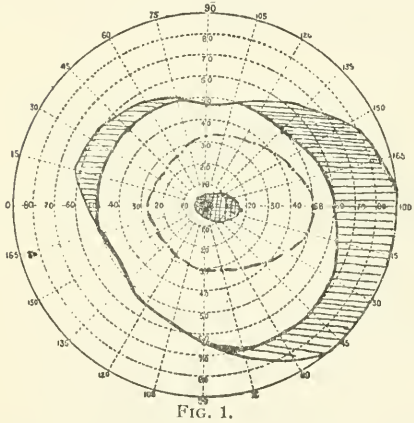


FIG. 1.

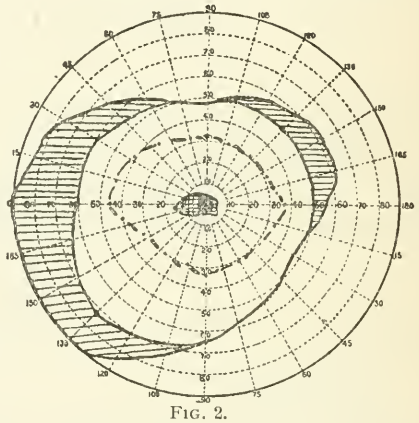


FIG. 2.

weakness and indifference than to any lack of mental qualifications. The knee-jerks are increased, and the grip of the right hand is stronger than that of the left.

Eyes.—Vision of the *right eye* 5/60; with + 4 spherical D.=2 at 25cm. The disc is nearly circular, with a scleral ring well marked all round, a sharp central excavation and faint choroidal ring outward, and some moderate choroidal disturbance in the circumference. The entire deeper layer of the disc is greenish, and considerably more than its temporal half is of a grayish-green color; superficial capillarity is preserved upon the nasal side. There are no lesions in the macula, no changes in the central circulation, and no noticeable perivasculitis.

The field of vision shows slight contraction of the form field, particularly upon the temporal side, a moderately good red field and a central scotoma, oval in form and for the most part *relative* in character, extending from 3 degrees on the nasal side to 12 degrees on the temporal side, and 3 degrees above and 7 degrees below the point of fixation. Directly surrounding the fixing point and within the relative confines is a small *absolute scotoma*, about 3 degrees in diameter. (Fig. 1.)

Left Eye.—Vision 5/35; with + 4 spherical D.=2 at 25cm. The description

of the fundus of the right eye already given applies also to the background on the left side, and the field of vision is very similar, containing an almost exactly similar scotoma of slightly smaller dimensions. (Fig. 2.)

The pupillary reactions are normal, and there are no palsies of the external ocular muscles.

In searching for an etiological factor to explain this case of optic nerve atrophy with central scotomas, we naturally think of toxic agents, inasmuch as the physical examinations have not given any evidence, at least any evidence at the present time, of either disseminated or fascicular disease of the cerebro-spinal axis, and syphilis seems to be excluded by the history of the case as well as this disease can ever be entirely eliminated. The later examinations of the urine indicate the probable existence of chronic interstitial change in the kidneys. The patient has a phthisical history, his father having died from this disease, and he himself looks phthisical, but bacilli are not to be found in his sputa. He has taken liquor, and has chewed tobacco to excess, but has not been recently either a chewer of tobacco or a drinker of spirits, having perforce abstained from these two drugs for at least two months.

He has been a house-painter for fifteen years, and therefore it is reasonable to look for signs of lead toxemia in his system. The old sign at one time so much relied upon, namely, the blue line around the gums, was not to be demonstrated, and in this particular investigation I was aided by Dr. Frederick Packard, who has had unusual experiences in the investigation of the so-called blue line in lead poisoning.

On the 22d of February the urine was tested for lead by the method which has recently been much recommended in qualitative analyses, and which was suggested to me by Dr. Packard, namely, by means of oxylate of ammonium and a strip of magnesium, and heat in the presence of a crystal of iodine. As a result the yellow iodide of lead was deposited.

Subsequently, at my request, Dr. Alonzo Taylor attempted to make a quantitative estimation of any lead that might be found in the urine, but reported his inability to get a lead reaction, pointing out at the same time the well-known fact that the elimination of lead in the urine in cases of chronic poisoning is not constant, and that it may be lacking for days at a time without any reason being apparent. Therefore another examination was made of the urine collected for twenty-four hours, and the following is Dr. Taylor's report: "The urine contains a small quantity of lead, eight milligrammes by weight as lead. Since the quantity is minute, the natural errors of even the best method count for more than if a larger amount were concerned. The error is entirely in the direction of loss; two milligrammes may have been lost in the process. Even in well-marked cases of plumbism the urine may contain only such small quantities."

Case II.—Thomas Stevens, aged 59, born in the United States, married, a house-painter, applied for treatment in the Eye Dispensary of the Jefferson Medical College Hospital on November 26, 1897, on account of failing vision.

History.—The patient says that he has had good eyesight until eighteen months before he applied for treatment, when "vision left him in half an hour." It gradually returned, and now he sees better than at that time, but still cannot use his eyes for anything like accurate vision. The central visual acuity was $\frac{15}{cc}$ and $\frac{20}{cc}$ respectively; the ophthalmoscopic record is: both nerves grayish, retinal vessels small, central scotomas for red and green. He was referred to the Nervous Clinic for further examination; but the examinations were negative so far as central nervous disease is concerned. There was no history of syphilis or rheumatism. The knee jerks were increased.

I first examined the patient on the 12th of February, 1898, vision at that time in the right eye being 10/cc and in the left eye 20/cc. Both nerves showed general gray-white atrophy; the veins were slightly tortuous and, compared with the arteries, large; the arteries were small, and there was well-marked, though not exaggerated, perivasculitis. Both pupils reacted normally, and there was no paresis of the external ocular muscles. The field of vision was as follows: Marked concentric contraction, especially upon the right side, very decided contraction of the red field and green blindness. In each eye there was a central scotoma extending from somewhat on the nasal side of the fixing point to about twenty degrees beyond it, in which area the appreciation of red and green was entirely lost. There was, however, no scotoma for blue, and no spots of absolute loss within the relative area.

The patient had nothing in his history which gave any good excuse for this optic nerve atrophy and perivasculitis, except exposure to lead. He smoked two cigars a day, was not a drinking man, had worked steadily at his trade, but not quite recently, had no history of painter's colic, nor had he ever suffered from wrist-drop. There were marked retraction of the gums and gingivitis. Somewhat uncertainly a blue line appeared to surround the upper incisor and left lower canine tooth. He was placed upon ascending doses of strychnine and nitro-glycerine, as he had previously taken large doses of iodide of potassium. At the end of two weeks he returned, his vision, if anything, somewhat less accurate than at the first time, namely: O.D., 10/cc.; O.S., 20/cc. Again, at the end of two weeks there was some depreciation of central vision, namely, in the right eye 4/cc, and in the left eye 15/cc. Examination of the urine failed to reveal albumin or sugar. The tests for lead, however, it was not possible to make at that time. He had carefully brushed his teeth and kept his gums in good order, so that the gingivitis had largely subsided, and still a blue line appeared, somewhat doubtfully, around the incisor and canine.

He returned to the dispensary from time to time, and at the last examination (4.6.98) the vision of the right eye was 6/cc (eccentric), and of the left eye 14/cc; ophthalmoscopically, the lesions were the same as those already recorded. There was even greater contraction of the field of vision of each eye, especially of the right, and typical central scotomas; on the right side the scotoma now included blue and white; on the left side, as before, red and green.

The faint gingival lines previously described were still visible, but no blue patches in the mucous membrane of the lip were discoverable. His urine was again submitted to an examination, which included tests for lead, with the following result: The urine contains neither albumin, sugar nor casts. There is

not a trace of lead in the entire quantity submitted to examination. Lehmann's method was employed, which for qualitative work is most delicate.

The treatment was changed to ascending doses of iodide of potassium.

If we assume that the optic-nerve degeneration in these cases was due to lead—and in the first instance the chemical examinations render this assumption a reasonable one—their record seems worthy because of the somewhat unfrequent occurrence of lead amblyopia in comparison to the number of cases of chronic lead poisoning. Bearing upon this point are Dr. Frederick Packard's* interesting researches. He examined forty-eight workers in lead, the time of exposure varying from one week to twenty-six years; the average length of time of exposure among those working in lead for more than one year being nine and one-half years. Thirty-three of these men had at one time or another exhibited symptoms indicating the toxic influence of lead, but no case of amblyopia traceable to lead impregnation was found.

Lead amblyopia is also rare, in this country at least, in comparison with the whole number of ocular diseases, although it is difficult to arrive at exact figures on this subject, as some of the cases of ocular disturbance are probably hidden under the general term, toxic amblyopia. Among more than 12,000 cases of ocular disorders recorded in the Jefferson Medical College Hospital and the Philadelphia Polyclinic during the last five years, there have been only three cases of optic-nerve or retinal change attributed to lead, and two of these are doubtful.

Finally, the percentage of lead amblyopias among the total number of so-called toxic amblyopias is small. For example, Uhthoff records 204 cases of retrobulbar neuritis among 30,000 patients; of these, 138 were toxic in origin, but only one was due to lead; tobacco, alcohol, diabetes and bisulphide of carbon furnishing the remainder.

The ocular manifestations of chronic lead poisoning may manifest themselves as a transient amblyopia, due to the anesthetic effect of lead on the optic nerve and retina; as an amblyopia due to retrobulbar neuritis, which may terminate in permanent atrophy; as an optic neuritis or neuro-retinitis specifically due to lead, which may be followed by optic-nerve atrophy; and, finally, as a vasculitis and perivasculitis of the retinal vessels.†

The first of the cases reported this evening appears to belong to that group of amblyopias due to retrobulbar neuritis, which may or may not

* Philadelphia Hospital Reports, III, 1896, p. 38.

† Naturally, many cases of optic neuritis, neuro-retinitis, etc., seen in chronic leadpoisoning, are secondary to nephritis or intracranial disorders. These cases are not now in discussion.

terminate in permanent atrophy. It has been argued by Stood and others that the retrobulbar neuritis of lead is analogous to the condition which lead causes in the musculo-spiral nerve, while Parisotti, on the other hand, believes that the atrophy of the papilla, which takes place without preceding neuritis, is due to changes which lead causes in the nutrient arteries of the optic nerve, changes which we know it may cause in the general retinal circulation. The character of the scotomas which have been reported in a number of cases indicates that the papillo-macular bundle is chiefly affected. This might be expected, because an abundance of clinical material indicates that this tract in the optic nerve is particularly obnoxious to the influence of toxic agents.

The second case, inasmuch as chemical examination failed to find lead in the urine, must, in spite of the presence of the slight bluish line on the gums, also somewhat uncertain in character, be relegated to the doubtful class. In this case there also appears to have been a neuritis, with special degeneration of the central fibers, the degeneration being much more widespread than in the first case, and associated with visible thickening of the coats of the blood-vessels and shrinking of their lumen.

OCULAR SYMPTOMS OF TABES DORSALIS.*

BY HIRAM WOODS, JR., M.D.,

OF BALTIMORE, MD.

Illustrated.

The frequency of eye symptoms in tabes dorsalis is variously estimated at 2 to 33 per cent. Gowers gives the latter figure.

Knies, in his book, *The Eye in General Diseases*, divides them into visual, motor, and pupillary. The approach of the first named is, as a rule, gradual. Commencing as an occasional dimness, it slowly advances, involving both central and peripheral sight. There are certain characteristics of this gradual failure of sight, not indeed confined to, or entirely diagnostic of, tabes, but still the usual manifestations of the disease. Central vision, both for form and colors, is apt to be preserved longer than peripheral sight. The field for both form and color contracts as central vision deteriorates, but not infrequently color field narrows out of proportion to form field or to macular vision. Upon this, Knies founds an important prognostic conclusion. He holds that when color vision

*Read before The Clinical Society of Baltimore, Oct. 22, 1897.

narrows out of proportion to white, the case will usually have a rapid course. The reverse is the case when the field for both form and colors contract pari passu. Central, or nearly central, scotomata are very rare, while vision, generally speaking, fails from periphery to center. The last vision to be preserved, as a rule, is eccentric. The lesion causing blindness is a primary gray atrophy of the optic nerve. Knies says: "The process begins as a disseminated one, and the atrophy extends in an ascending and descending direction. The middle fibres of the nerve remain longest intact, and we may therefore infer an action starting from the periphery. This may take place most readily at the place where the nerve passes through the unyielding optic foramen. The gray atrophy is also noticeable in the chiasm, tractus, and as far as the primary optic ganglia, but there is no direct connection with the degeneration in the spinal cord. * * * The retina constantly exhibits atrophy of the nerve-fibre and ganglion-cell layers, the other layers appearing essentially normal."

The atrophy bears an interesting relation to other symptoms of tabes. As a rule, both eyes are affected, the atrophy involving equally both nerves. It may appear early in the disease, and may be noted years before other symptoms. Gowers saw it fifteen and twenty years before other tabetic symptoms. "It is claimed that when blindness from atrophy of the optic nerve occurs at an early period, especially when it runs a rapid course, a slow course of the tabetic symptoms proper may be expected." [Martin, quoted by Knies.] A very rapid course of atrophic symptoms is, in the opinion of Knies, suggestive of wrong diagnosis. He says: "Rapid atrophy is more common in neuritic and sclerotic processes than in primary atrophy of the nerve substance. As a general thing, the prognosis of those diseases which may be mistaken for tabes is more favorable, and only those cases in which an autopsy is obtained may be regarded as conclusive."

In some diseases of the central nervous system which must be diagnosed from tabes, there are eye symptoms of more or less positive kind. Knies holds that in multiple neuritis involving the posterior roots, and the inflammation of an ascending type, the diagnosis may be difficult. The course is, however, usually rapid; a history of acute infection is often obtainable, while the eye symptoms differ from those of tabes. The edges of the nerve are hazy, showing optic neuritis. This does not occur in tabes. The vision may not be reduced at all, or if affected, there is central scotoma and color disturbances. Moreover, the pupil symptoms, the most characteristic of tabes, are entirely wanting. In multiple sclerosis,

atrophy commences in the connective tissue. Clinical characteristics are occurrence of focal symptoms and maintenance of conduction, although this may be interfered with to a greater or less extent. Vision gets better and relapses, blindness is often out of proportion to the appearance of the papilla, and the reverse may be true. Central scotoma is not uncommon. While the pupils are usually contracted, their reflex excitability is increased, and twitching of the eyes or nystagmus is prominent. None of these occur in tabes.

A few points regarding the affections of the ocular muscles are worthy of note. Paralyses of the external eye muscles usually appear suddenly and disappear with or without treatment. Their duration may be only a few hours. Fournier makes distinction between syphilitic and tabetic paralyses as follows: In syphilitic paralysis of the motor oculi a large number of muscles are affected; in tabetic a single muscle is the rule. The former paralyses are accompanied by headache, vertigo, epileptiform attacks, etc.; none of these occur in tabetic paralysis. In syphilis accommodation is apt to go early; in tabes it remains intact a long time. Galezowski, on the other hand, thinks that unilateral paralysis of accommodation is occasionally the first symptom of tabes. Syphilitic paralyses are permanent—at least, much more so than tabetic. Regarding the sudden onset and rapid disappearance of tabetic paralysis of the eye muscles, Knies thinks that "every paralysis of an ocular muscle which occurs suddenly in a healthy person (without injury, apoplexy, or other brain symptoms, diabetes mellitus or insipidus, syphilis, albuminuria, etc.), arouses the suspicion of a beginning tabes, especially if it recovers in a comparatively short time or subsequently relapses." Berger thinks that muscular symptoms predominate over spinal in tabetics who also have syphilis, while the reverse is true in patients who are not syphilitic. The muscles most frequently involved seem to be the sphincter pupillæ, and other individual branches of the group supplied by the third, and external rectus. Knies says true conjugate paralysis is never observed. "The lesion is chiefly a primary atrophy of the nervous elements of the nerve fibers and ganglion cells. Often the nerve roots are the seat of this atrophy. If the claim of Moëbius (*Twentieth Century Practice of Medicine*) be, as I think it is coming to be, admitted, that syphilis is "absolutely and always the cause of tabes," a distinction like the above, quoted from Knies, loses its value, save as a prognostic sign. Treatment would be only more rational; for with the conditions described, one would use syphilitic treatment, whether he had a history or no, and hope his diagnosis was correct.

The pupillary are of the greatest value of all tabetic eye symptoms. It is to be borne in mind that there are two distinct actions of the pupil: One, the consensual pupillary light action; the other, the pupillary contraction associated with accommodation and convergence. This is not alone due to the fact that the ciliary, sphincter and internal recti muscles are all supplied by branches of the third. There is a mechanical element dependent upon the blood in the ciliary bodies being forced during accommodation into the iridic blood-vessels. The influence of the cilio-spinal ganglion upon the dilators of the iris is to be also held in mind. In tabes, an occasional early eye symptom is mydriasis, explained by an irritative lesion of the cilio-spinal ganglion. More common is a myosis, explainable partly as the result of a destructive, or at least inhibiting, lesion at the same ganglion, giving rise to paralysis of the dilator pupillæ. But with this myosis there comes another pupillary symptom, called by Knies "reflex pupillary rigidity." This is attributed to "nuclear and perinuclear processes, as a result of which the centripetal fibers of the first reflex arc are interfered with or divided. The nucleus itself may be involved at a later period. This explains the comparative independence of the spinal and cerebral pupillary disturbances which may be absent or present in various combinations as the result of irritation of one part and paralysis of another."

Discussing under another section reflex rigidity of the pupil, without reference to tabes, Knies mentions the lesion alluded to above as interfering with *light* conduction to the sphincter nucleus, and says we should naturally expect as a result of this absence of light stimulus dilatation and not contraction of the pupil. He adds: "It appears as if in destruction of the fibers which break up in a terminal network in the sphincter nucleus, a constant irritation is exercised upon the ganglion cells lying within the network. This view is corroborated by Uhthoff's case, in reflex rigidity of the pupil."

Then, myosis, partly as a result of paralyzing lesion at the cilio-spinal ganglion, which slight pupillary contractions were constantly occurring during and partly from irritative lesion at the centripetal side of the sphincter nucleus, is observed in tabes. But this same lesion finally destroys the reflex at the sphincter nucleus and produces pupillary rigidity. Loss of response to light, even with unimpaired sight, results. At the same time, on convergence and accommodation, the mechanical contraction of the pupil from blood pressure remains, and there is observed a rigid and (probably, but not necessarily) contracted pupil on exposure to light, but prompt contraction to accommodation and convergence—

the Argyll-Robertson pupil. Moëbius (*Loc. Cit.*) considers this pupillary rigidity to light with action to A. and C. pathognomonic of tabes. He says that if it is present, the "diagnosis is made."

Recently I observed, rather close together, some cases illustrative of eye changes in tabes. Clinical notes of three of them are appended:

Case 1.—Left Mydriasis, with Temporary Paresis of Left Ciliary, Internal and Inferior Recti, Impairment of Right Levator Palpebræ Superioris, and Superior Rectus, later development of Argyll-Robertson Pupil and Tabetic Symptoms.—Mr. F. D., 32 years of age, of strong physique, and, as he believed, of unimpaired health, consulted me May 25, 1895, for these symptoms: poor vision in left eye of one week's duration, diplopia for three or four days, occasional difficulty in opening right eye, or in keeping

Fig. 1.

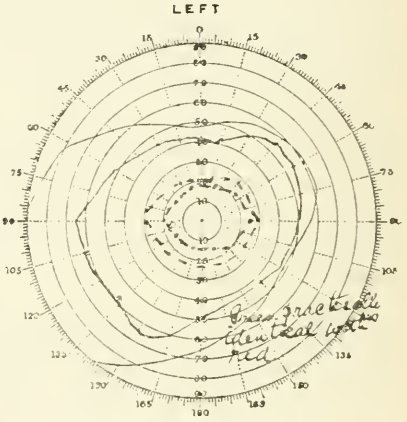


Fig. 2.

it open, as it would sometimes "shut involuntarily." Slight giddiness, and pain in looking down were the only additional symptoms I could obtain. There was no history of illness. He confessed to having had gonorrhea, but at this time, at least, was sure he had not had syphilis. Later he admitted the possibility of such infection.

Examination showed: Media and fundus healthy in each eye; distant vision, 20/20 each; Jaeg. 1, R. E., 7 L. E. Latter read Jaeg. 1 at one-third metre with aid of +2 D. S.

Pupils: Left, a third larger than right. Both reacted to light and accommodation. Although there was left mydriasis, there was no sphincter paresis.

Extrinsic muscles: No visible deviation from parallelism, in any position nor visible defect in mobility. On exclusion, however, there was deviation, R., out and down, L., out and up. Candle test showed crossed vertical diplopia on horizontal plane, increasing in lower field, and persisting to a less extent in upper. Images on horizontal plane at twenty feet were fused by a 10° prism, base down, on L., and a 20° abducting prism on either eye. I could make out neither at this nor

later examinations trouble with the levator of the right lid, though the patient repeatedly insisted on the occasional involuntary closure of the right eye.

Kal. Iod., in rapidly increasing doses, was ordered. On the 30th of May, candle test revealed diplopia only in lower field: a lagging of the left eye in infraduction being clearly noticeable. On June 5th, notes show that in convergence the left eye everted at 15cm. Other conditions unchanged. On the 8th, when he was taking 55 grains of KI. t.d., diplopia was not noticed in any field, but was easily produced in the lower by a red glass. There was eversion on excluding either eye. Left pupil was still dilated, and contraction to light less active than in right. The falling off in this pupillary action of left eye was marked, P.P.A., R., 10cm., L., 33cm. On 16th, when his dose of KI. was 70 grains t.d., he could read Jaeg. 1 at a third of a meter with the unaided left eye. During these three weeks he had not developed tabetic symptoms. I have no

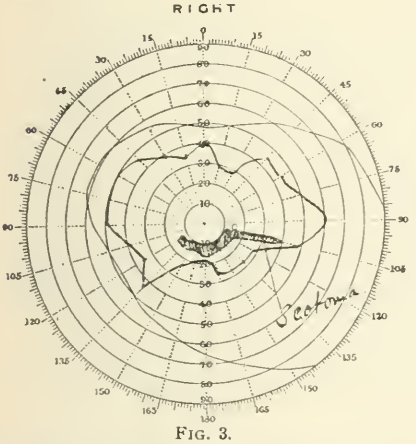


FIG. 3.

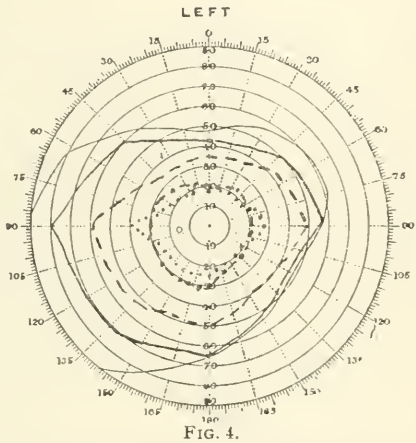


FIG. 4.

note of his patella reflex, though, unless I have confounded him in memory with another patient under care at the same time, it was unimpaired. When he disappeared after the cure (?) of his eye troubles, I felt that he was a syphilitic with tertiary manifestations, and that sooner or later he would turn up somewhere with other deep lesions. I next saw him March 3, 1897. His gait, when entering the office, was unmistakable. He gave a pretty clear history of increasing trouble in walking, pains in lower extremities, etc. There was no inconvenience in eye work. I found the patella reflex abolished. The eye condition was: partly dilated left pupil, feeble response to light in either eye, but prompt to A. and C.; near point A. 10cm. each. No diplopia. At my suggestion, he consulted my friend, Dr. F. T. Miles, who found other characteristic tabetic symptoms. On July 2d, the fields were taken for the first time. They show scarcely any form contraction in the right and not excessive in the left eye. In each, however, colors are disproportionately narrowed.

I have seen Mr. D. several times since. He is in active business, and seems, barring his ataxic gait (which does not prevent him jumping on a moving car, as

I saw a few weeks since), in perfect health. In October, 1897, when I made my last examination, the eyes presented the same condition, save that the left pupil was not as dilated as it had been, while rigidity to light, with action to A. or C. was present in both pupils.

There are several interesting points in this clinical history. It illustrates, generally, the possible far-reaching nature of what may appear at first as an ordinary paralysis of an eye muscle. Syphilis was assumed as a cause, and treatment instituted before its presence was admitted. And yet, the very rapidity of recovery, and the tendency of tabetic paralyses (even if they are also syphilitic—as Moëbius claims they practically always are) to spontaneous recovery, throw doubt on the effectiveness of the

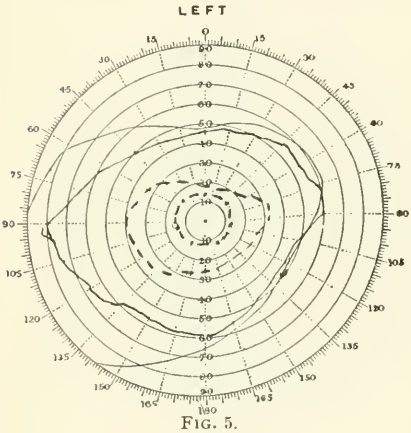


FIG. 5.

FIG. 6.

KI. Another point is the early mydriasis, with persistent pupillary action and impairment of A. It looks as though there was at first an irritative lesion of the dilating fibers of this, with an inhibitory of the ciliary muscle. The persistence of good vision, while the spinal symptoms rapidly developed, and the contraction of color out of proportion to form fields, correspond pretty closely with the observations quoted from Knies.

The fields, as taken in July, 1897, are appended. Figs. 1 and 2.

CASE 2.—UNILATERAL (LEFT) ACCOMMODATIVE PARESIS, PERMANENT. FOLLOWED IN FOUR MONTHS BY RAPID RIGHT OPTIC NERVE ATROPHY, PARACENTRAL SCOTOMA, AND A YEAR LATER (PROBABLY) BY COMMENCING ATROPHY OF LEFT NERVE. RIGHT MYOSIS; SLOW DEVELOPMENT OF ARGYLL-ROBERTSON PUPIL.—Mr. L., aged 38, merchant, living in eastern Maryland, consulted me October 15, 1895, for poor vision, specially in near work, in the left eye. There was no other symptom. He had no pain, and history was negative.

Apparently, he was in perfect health. External and ophthalmoscopic appearances were normal in each eye. Pupils were of normal size and reaction. Movements normal, and the phorometer showed orthophoria. Visual tests were: R. E. 20/30, made 20/20 by -0.5 D. Cyl., Axis 90°.

P. P. A., 13cm., Jaeg. 1 read by naked eye.

L. E. 20/40, made 20/20 by +0.75D. Sp.=H.m.

P. P. A., 28cm., Jaeg. 1 read only with aid of +1.50D. Sp.

As there was no asthenopia, and Mr. L. was averse to wearing glasses—indeed, said, after an hour's trial in the office waiting-room, that reading was more comfortable with naked eyes—no treatment was instituted. He was advised to call if asthenopia developed.

I next saw Mr. L. February 8, 1896. He now spoke of failing vision in the right eye. Visual acuity was reduced to 20/70. It could not be improved by

FIG. 7.

glasses. Jaeg. 1 was indistinctly deciphered at six inches. Condition of left eye was unchanged, as were also the pupillary and muscular phenomena. There were no remote symptoms. Tendon reflex was not affected. His field was not taken, or, if it was, the chart cannot be found now. I tried again to bring out a specific history, but either accidentally, or designedly, the patient did not give it. The right optic nerve was white, and evidently becoming atrophic. He was put on increasing doses of strychnia, commencing with a twentieth, and running rapidly up to a fifth, three times a day, at which time he showed physiological symptoms. He was kept on this for three weeks. I then lost sight of him until the 8th of July. In the mean time he had sought the optician's advice, and was armed with three or four pairs of strong convex spher-cyls. His condition at this time was, right eye, V. 3/200, no near vision, and atrophy well advanced. The field was obtained with some difficulty. It shows (Fig. 3) an unusual condition in tabes: a paracentral scotoma. At the same time, the form field is irregularly narrowed. Color perception was entirely lost. The left eye was unchanged, save that a little more help was needed in reading: +2.75D.S. Field for form and color was unaltered. No general symptoms were noticeable. He now admitted

a probable syphilitic history, and was put on increasing doses of KI. This was run up to a dram t.d., in a short time, when I again lost sight of him, and his next visit to me was the 23d of March, 1897. The right eye had only l.p., and the nerve was in a condition of white atrophy. Visual acuity left eye was unchanged. There was now a new pupillary symptom: the right pupil (that of atrophic eye) was smaller than the left. It responded feebly to light thrown in the right, more promptly, when the left retina was illuminated. I thought, however, that consensual pupillary contraction to light was lessened in both eyes, even on left illumination. It was markedly less active than to accommodation. The left field showed narrowing for both form and color, greater for latter (Fig. 4).

Patella reflex was now found lessened. I sent the man to Dr. Miles, who reported the case as one of "undoubted tabes." He advised the rapid increase of KI to tolerance.

My last examination of the patient was July 23 and 24, 1897. The right had lost l.p., while the left eye still had 20/20 with +1D. Sp. He made some mistakes, and said it "looked hazy." The pupil was very small in the right eye, unaltered in the left. There was no light reaction in either eye, illumination of each being tried successively. Each pupil contracted to A. The field for the left eye showed color contraction since March. This, in connection with the 'haziness" in central vision, is significant of the future. Indeed, one could with little difficulty perceive pallor of the left papilla then. Patella reflex was about gone. Gait was unaffected.

I heard from Mr. L. in the fall of 1897. He wrote easily, and said his symptoms were unchanged. He was still taking KI. A dram t.d. is his limit.

Case 3.—Partial Right Ptosis, Day Blindness, Nerve Atrophy.—While I saw this patient only twice, the symptoms are sufficiently characteristic and interesting to justify reporting the case. A. S., 27 years of age, consulted me May 15, 1897, for day blindness and difficulty in keeping the right eye open. Mr. S. was, and still is, I believe, a newspaper carrier. He said that, for a few months, as soon as the sun rose, his sight became dim. Light was not irritating. He was not conscious of much falling off in visual acuity. A partial right ptosis was apparent. Otherwise there was no defect in the extrinsic muscles. Both pupils were contracted and entirely immovable to light, though both became still smaller on A. and C. Functional examination showed:

R. E., 20/40, Jaeg. 1; L. E. 20/70, Jaeg. 11. Neither could be helped. Field examination showed practically entire loss of peripheral vision in the left, somewhat better range in the right. (Figs. 6 and 7.) There was advanced gray atrophy of both optic nerves. The only remote symptom I discovered was, as I thought, loss of the patella reflex. I sent the man to Dr. Henry J. Berkley for diagnosis, without reference to the eye symptoms. He found that the patella reflex could be brought out to a slight degree by having Mr. S. grasp tightly with the hand a ruler while the experiment was made. Upon the presence of several anesthetic areas and other symptoms, he pronounced the case tabes.

Doubtless the unfavorable prognosis drove the patient away from both of us. I heard a few months ago that his condition had not changed. There was clear history of syphilis.

It is not, I think, easy to explain the day blindness. It was insisted

on as the only really distressing symptom. Mr. S. stayed in the house until evening, if the day was bright, because he could not see well enough to trust himself out of doors. Absence of central opacities in the media, of central scotoma, and of pupillary action to light excludes this common explanation of defective vision in a bright light. Quotation has already been made from Knies that the nerve elements of the retina undergo atrophic changes in tabes. Speaking directly of day blindness, he says: "This is observed when, for any reason, an abnormal amount of light enters the eye—or in imperfect pigmentation of the fundus oculi—and also in certain diseases of the retina and the optic nerve. In all these cases the efficient factor seems to be the insufficient restitution of the material employed in the act of vision, this being sufficient only when the action of the light is diminished. The diminished nutritive changes which have become habitual in those parts of the retina which are sensitive to light do not suffice in bright daylight."

These statements only put the cause of the day blindness in some unknown change in the photo-chemic properties of the retina, occurring in connection with atrophy of the retinal nerve elements.

842 Park avenue.

THE SCIENCE OF OPHTHALMOLOGY.*

BY DUDLEY S. REYNOLDS, A.M., M.D.

Professor of Ophthalmology, Otology and Medical Jurisprudence in the Hospital College of Medicine, Medical Department of the Central University of Kentucky.

OF LOUISVILLE.

The science of ophthalmology is in great danger of becoming tainted with loose methods of approximation. It is related of Friar Bacon, who invented spectacles, that he ground his own lenses. Keppler, to whom the world is indebted for many discoveries in astronomy, elaborated and simplified the methods of grinding lenses, and they came at once into general use. The original plan was based upon the idea that the maximum angle of refraction in a spherical body expressed the unit. The quadrant of the sphere being the unit, had its focal length in the radius, minus the interruption of the passage of light through the lens, this being great or small, according to the index of refraction of the media used for making lenses. If the radius of the sphere from which the unit was derived were twelve inches, the focal length of the unit would be

*Read at the meeting of the Western Ophthalmologic and Otolaryngologic Association, Chicago, April 7-8, 1898.

twelve inches, minus the resistance of the medium to the passage of light. For spectacle lenses, the radius of the unit, it has been agreed, should be one inch, or twenty-five millimeters. Now, if we adopt the English inch, the French inch, or the Prussian inch, all of which are materially different, we should, of course, have the lenses in these systems made of fractional parts of the unit; and as this is the quadrant of a sphere, focal lengths would have to be measured by the same system of determining the radius; and so it was, in former times, the custom of the English-speaking people, the French, and North Germans, to employ systems peculiarly their own.

In an attempt to popularize this branch of science, and to give it common characters which would be acceptable to all nations, the International Ophthalmological Congress of 1867, on motion of Professor Javal, appointed a committee to investigate the merits of the different systems of grading lenses, and report some method which should be universally acceptable. That committee fixed upon the plan of grading lenses by focal lengths, and established the meter as the unit of measure, and fixing the whole series required for a complete case of test lenses with definite inter-focal spaces. It had already been noted that, in the fractional system of gradation, although based upon the radius of curvature of the refracting surface, the lenses were required to exhibit uniform refracting power; and, as different media were employed for making the lenses, and different units of measure to determine their radii, constant disparity appeared in the results of their application. The eyes of persons having but slight errors of refraction, and especially in cases of astigmatism, refused to be comforted by the best directed attempts at correcting their refraction, and so Giraud-Teulon conceived the difficulty must be in the ocular muscles. He practiced decentering the lenses, and claimed great advantage from their use.

In 1868, Dr. Herman Scheffler concluded, from the favorable reports of the use of decentered lenses, that each lens should be made periscopic, n order to measure uniformly the whole outer field of vision. His work on the "Theorie der Augenfehler und der Brille" presents a thoroughly scientific analysis of the refracting powers of prismic, spheric and cylindric bodies, separately and in combination, in their varied application to the correction of errors of refraction in the eye.

Paetz and Flohr, of Berlin, practically abandoned the radius of curvature and introduced a series of test lenses graded by focal lengths, adopting the Prussian inch as the standard. The prismic base of each lens in the series constituted an orthoscopic combination. The prisms

were designated in degrees, minutes and seconds, according to the angular deviation of the light passed through them. This, it was supposed, would yield such precisely accurate results in grinding lenses as to enable the optician to give each of them the proper periscopic form. Then it became necessary to still have recourse to the capacity of the eye to unite parallel rays of light in a uniform angle to determine at the same time the acuity of perception.

With the definite sized test letters of Snellen came a uniform distance for positive infinity, or parallel light. Now, if the Prussian inch determined the unit of refraction in the lenses, it is manifestly clear the Prussian linear measure must be employed to fix the point of positive infinity. As Snellen constructed his test letters at first upon the basis of English measure, it is natural that great dissatisfaction in France and Germany should have arisen upon the adoption of a system foreign to their own.

When the metric system of gradation was finally agreed upon, Snellen re-calculated the relations in the size of his test letters for the new point of positive infinity, fixed at six meters. However much we may incline to criticise the want of accuracy in methods of grinding lenses, and the merits of the meter as a unit of measure, we must allow that its adoption necessarily does away with a very large percentage of those errors incident to our former lack of uniformity in the units of measure.

Inasmuch as the distance at which the test object is placed for measuring the capacity of the eye to unite parallel rays of light has been fixed at six meters, and the relative acuity of vision is expressed in angular measure, it is manifestly clear that neither more nor less than six meters shall be employed to represent the distance, and that no other terms than those of the relative angle of visual perception shall be used to record the result. Neither vulgar fractions should be employed, nor any inharmonious system of notation.

Of the scientific toys designed to afford cheap and easy methods of evading the exacting demands of the details of a circumstantial analysis, not one of them can do away with the necessity for an accurately graded series of test lenses, the complete suspension of the accommodation of the eye to be tested, and the geometrically graded test objects, placed at the point of positive infinity.

It will not do to say that David O'Flaherty, with accommodation suspended in his right eye, sees with + 2.00 D = $\frac{1}{6}$ of normal; yet this is a good illustration of a very common mode of expression. A very valuable contribution on the clinical uses of certain cycloplegics is marred by the statement of a metrical lens required to secure vision = $\frac{20}{200}$.

The science of ophthalmology cannot be preserved in its concrete form if such matters as these escape our attention. It is not to be wondered that disappointment so frequently follows loose methods of analysis as to lead both patient and practitioner astray in searching for causes of pains and aches that refuse to yield to the supposed correction of errors of refraction.

The decentered lens and the prism have seized upon the minds of some, whilst others have apparently gone daft in their search for ocular tendons to cut, or advance. An enthusiastic surgeon has recently reported his achievements in the looping of ocular tendons with catgut ligatures. Our confrere, Dr. George T. Stevens, has created an apparently rational place for partial tenotomy; but it is not an uncommon occurrence to read of a dozen or more tenotomies, or advancements, of the tendons in a single eye. With the tendon looped, muscular coördination in the movements of the eyes might, in all probability, be expected to observe not alone the lateral, the vertical, and the rotary movements, but, like the famous gun with the curved barrel, made to shoot bears behind trees, turned in all sorts of irregular directions to compensate for the eccentricities of opposing tendons.

A fine illustration of the results of painstaking practice is presented in the person of Mrs. T., aged 30, the wife of a prominent practitioner in Louisville. She came to me on the 19th of October, 1896, with divergent squint, photophobia, indistinct vision for distance, and total inability to read. She had suffered almost continuously with sick headache for a long time, and having been told that the ocular tendons must be advanced, her husband brought her to me, with the object of having whatever operating found necessary, done at once. On attempting to suspend the accommodation, I found she had unsteady muscular movement, the rotary muscles being in an almost constant state of activity. Without glasses she saw nothing; with the glasses she had she saw 6/xxxvi, Snellen, with the right eye, and 6/lx with the left eye. On examination of the glasses, I found for the right eye she had— 0.75 c. axis 170° ⌒ — 0.75s combined with a prism of 3°, base inward. In the left eye she had + 2.00 c. axis 110° ⌒ ⌐ — 3.50 c.

I prescribed homatropin drops to be instilled twice daily, and directed smoked coquilles to be worn constantly, and no attempt to be made to see objects, excepting for purposes of going about. She went to the country, and remained until April 30, 1897. When she returned, the eyes were re-examined, under homatropin, the use of which had been kept up during her entire absence. I found + 1.00 c. axis 90° enabled the right eye to see = 6/vi Snellen; + 2.00 c. axis 90° enabled the left eye to see = 6/vi— Snellen. These glasses were prescribed, and she has worn them constantly ever since. She is fond of reading, and, having no children, has spent the past year in almost constant reading, with not more than two attacks of headache during the entire year, both of these clearly due to indigestion. The glasses she had formerly worn were chosen after a most painstaking and thorough analysis with the Javal-Schiotz ophthalmometer,

the ophthalmoscope, and the Zengrefractometer, in the hands of an experienced practitioner. It may be remarked that she narrowly escaped a series of tenotomies and advancements.

The great point to be considered is that sufficient care should be taken to establish complete suspension of accommodation, and no final attempt to determine the state of refraction should be made for persons whose general health is such as to disqualify them from engaging in the normal use of the eyes. Proper discrimination in these matters, and a judicious course of constitutional treatment necessary to restore the patient's general health, are too often overlooked, or neglected.

CATARACT EXTRACTION: VALK'S OPERATION.

BY FRANCIS VALK, M.D.

Professor of the Diseases of the Eye, New York Post-Graduate School and Hospital, etc.. etc.

Illustrated.

The crowning operation in ophthalmic practice is the removal of the crystalline lens, for by this operation we at once restore our patients from a condition of more or less blindness to that of improved vision and usefulness; moreover, this operation is of so much importance to many of the human race, and of a condition to which all may be liable, that any procedure tending to relief is justifiable and worthy of earnest consideration.

Experience is an excellent teacher, though many times a sad one; yet, it may tell us very often what is best to do, and assist us in the selection of the best method of procedure. The first object or consideration the surgeon must have in mind is the ultimate good of his patient. To attain this he should lay aside all other considerations and make his decisions with that end in view. Under these conditions the surgeon must not only have a certain amount of experience, but should be familiar with all the methods that have been tried by other operators, in order to know and judge what will best succeed in the case before him for operation.

I do not think, at the present time, that any one procedure can fulfill all the indications, nor be suitable for every case. One operator will have good success by one method, while another may take a very different procedure and yet have the same final result. As we read the literature of the present day we find two methods for the extraction of the crystalline lens which seem to take precedence over all

others, namely: The "combined method," and the "simple" operation; but as we find many strong advocates of each method, we also find many opponents of both.

By the "combined method" we eliminate the mechanical interference of the exit of the lens, yet on the other hand, we, at the same time, subject the eye to two very serious operations, either one of which, under certain conditions, is great enough to destroy the eye. By the "simple method" we do not operate on the iris, yet the iris is so pushed upon and forced out of the eye, and so freely manipulated that the dangers of the after-coming prolapse of the iris are so great that many operators have abandoned it and returned to the "combined" operation.

No operation can be free from all these objections; there is no middle path, nor is there any "Royal Road," but after several years' experience in the method to be described, I feel justified in again presenting it to the profession, especially since I am inclined to think that the objections to its use may be less than in either of the other two methods. All other procedures, such as the removal of the lens in its capsule, or that of the use of the knife alone, possess too many dangers to be followed or approved.

The operations for extraction which have received the approval of nearly all the members of the profession are of two methods: That of the "combined"—an operation that was at one time called von Graefe's, but only because his knife was used; and the "simple," or the old operation, which has been revived and almost universally adopted. I may also speak of my own method in this connection, to be hereafter described, which I claim is a combination of the advantages of the other two operations.

The technique of the "combined" or the "simple method" is familiar to all surgeons, each one presenting certain advantages, and each having its dangers. These dangers cannot be eliminated by any skill, experience, or care, for I firmly believe, from my own experience and that of others, that in cases of complete and distressing failure, the failure is due to causes existing in the individual operated upon and not to the fault of the operator.

In all methods for the removal of cataract and the restoration of vision, there are many similar points and procedures; but the chief aim and object of the operator must always be the selection of that method which, from all the indications, is likely to give the best and safest results to the patient.

Bearing this in mind, we must decide what operation to perform and

the indications for a successful result. For example, a shallow anterior chamber would indicate that the section must be made small, and even then there will be more or less difficulty in the extraction of the lens by the "simple method," in which event we must change our plan of operation and remove a portion of the iris so as to take away this mechanical impediment to the exit of the lens. A sluggish movement of the iris, or any slight posterior synechia, would indicate an iridectomy before the exit of the lens; and after the lens has been removed, if the iris show any tendency to prolapse, it is best to cut it off at once, even if it can be restored to its place in the anterior chamber.

On the other hand, we may decide that a large cornea, a deep anterior chamber, and a clear iris, readily movable, are clear indications in favor of the removal of the lens by the "simple method," with complete success in the end; but at the same time there are other objections to this method that present themselves at the time of the operation, or after the healing of the wound. In the "combined method" I think the two great operations on the eye at the same time—the iridectomy and the extraction—renders the process much more dangerous and liable to infection or inflammatory processes that may ultimately mar the result; and then again, the coloboma, from the removal of a portion of the iris, tends to reduce the final results of vision from the admittance of more of the peripheral rays. In the "simple method," the force generally required,—even when most carefully applied—for the tipping of the lens in its fossa and expulsion is dangerous, and requires a very nice adjustment of that force; yet, a successful operation by this method gives results most devoutly to be wished.

All of these advantages, I claim, can be obtained, and all of these disadvantages can be eliminated by my method, but at the same time I cannot claim that it is free from all dangers and mishaps, as in no case can we prevent an incarceration of the iris, or a prolapse or possible infection of the wound. And the objection that it is another instrument introduced into the eye will not hold good in the present light of antisepsis, and the increased skill of the operators of the present day.

Since 1887, when I performed my first operation, to the present time, I have used this method in nearly fifty cases without the loss of a single eye; and the results have been very satisfactory, especially when it is considered that my cases were not selected in any way, and that I have attempted to operate on all in this manner, and did so, except where some accident, such as the patient forcing the iris against the knife at the time of the section, has prevented my following the steps

that I had proposed in the beginning of the operation. In a few words, then, my object is and has been to have the advantages of an iridectomy without the cutting of that membrane and the consecutive coloboma.

This operation has been presented in papers before the Clinical Society of the New York Post-Graduate School and Hospital, of the New York Academy of Medicine, and also before the Section on Ophthalmology of the First Pan-American Medical Congress, and I still continue to operate by this method, for it seems to me to fulfill the old injunction to operate "tuto, cito et jucunde," and the fact that this method has been copied by Dr. Pitts (see *Medical Record*, October 1890) gives it at least some merit, though Dr. Pitts does not give me the credit of holding the iris "tucked back" until the lens passes out, but does criticise my method, which speaks for itself.

I do not make my patients undergo any special preparation before the operation, except giving a mild purgative the day before. At the time of the operation the lids and brow are washed with a solution of boracic acid, but not the conjunctival sac, while the instruments are all cleaned with hot water, or if possible, sterilized. Nor do I dilate the iris with atropine before the operation, for I believe we can make a better section, with less danger of wounding the iris, when the pupil is normal in size; and then again, because the iris will always contract as soon as the intra-ocular pressure is relieved at the commencement of the section. For the same reason I do not put cocaine in the eye until about five minutes before I am ready to operate.

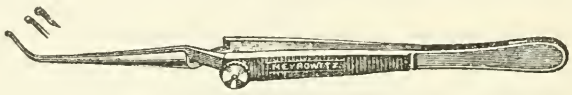
It is my firm belief that on the section of the cornea depends, in a great measure, the success of an operation, as a perfect section, properly made, will rapidly heal. I never make the conjunctival flap, as I consider this process would endanger the final result, and render hemorrhage very liable to obscure the field of operation. It might tend to prevent prolapse of the iris, but I am not convinced of it yet by my own experience; consequently, I make the section to include about two-fifths of the periphery of the cornea, and so as to have the puncture and counter-puncture in the clear corneal tissue about one millimeter from the limbus. An incision of this size will be sufficient for the extraction of the lens in all cases, and I doubt very much if any operator can tell the relative size of the lens before the operation. In making my section, I have followed the method suggested by DeWecker, and it should be nearly completed before the anterior chamber has emptied itself. This section is made with the knife by three clean and distinct cuts in this manner: After the point of the knife has made the counter-puncture, it is carried

rapidly forward and upward, thereby cutting one side of the section; the knife is then drawn backward and upward, cutting the other side of the section; at this point the knife is near the periphery of the cornea, and I now turn it slightly on its axis, and complete the section by cutting outward with one clean cut.

When the section is made in this way we have clear, sharp edges that will approximate perfectly, closing the wound at once; and at the same time the portion of the cornea at the upper part will leave room for the iris when tucked back, while in the vertical meridian it will act as a support for the arch of the cornea, and prevent any slipping of the edges of the wound and prolapse of the iris. In a few cases, particularly if we have a very shallow anterior chamber, we cannot follow this procedure, and it may be necessary to make the section by the to-and-fro movement; but such a section makes a wound in the cornea that cannot approximate readily, nor can it heal so rapidly. I still prefer, in the next step, to do a peripheral capsulotomy by passing the cystotome inward to the center of the pupillary space, and then as the point turns downward it is passed gently beneath the edge of the pupil and swept around to an extent of about one-half of the circumference, corresponding with the section in the cornea. This section of the capsule requires great care and accuracy in the adjustment of the cystotome, and calculation as to how far it shall pass under the iris; but it has never failed in my hands to give me a swift and ready exit of the lens. Nor have I yet met with any cases in which the anterior capsule was so thick that the forceps were required to tear it away, while the question of a final needling remains to be settled after the operation. At this point in the operation I depart from the usual steps, and proceed to follow out my method of extraction of the lens, in which I claim that I have the advantages of the "simple" and the "combined method." Hence my next step in the operation is the drawing back of the iris, and holding it "*tucked back*" behind the scleral edge of the section until the lens begins to pass outward. This procedure is performed by the use of my *Iris Retractor*, as shown in the illustration, and I believe that I was the first to use this method in the extraction of the lens. Dr. Knapp, in the "Archives of Ophthalmology," March, 1888, page 60, states that he has drawn back the iris toward the periphery when he found that membrane somewhat rigid, using the small wire loop in order to facilitate the exit of the lens; and the same method seems to have been adopted by Dr. Pitts in the *Medical Record*, October, 1890, three years after I published my first paper, wherein he describes a method of operation by drawing back the

iris with a similar wire loop, and holding it there until the lens passed out by pressure on the lower part of the cornea. In the same paper Dr. Pitts criticises my retractor, when, according to his own admissions, he has never seen my instrument, nor does he even know its construction, but has simply followed out my ideas, and drawn back the iris while the lens is being removed. His method and my own are practically the same, but the wire loop is a much more dangerous instrument in the eye, because it cannot be removed quickly in case of any sudden movements or loss of vitreous, while the retractor can be instantly removed, and does not take up any more room than the wire loop.

The construction of this little instrument is very simple, as is shown



Dr. Valk's Iris Retractor.

in this illustration—having two small knobs on the ends of a pair of iris forceps with crossed action. These little knobs stand at right angles to the axis of the ends of the blades, and point downward when in position, and hold the iris tucked back in the superior space until the lens passes into the corneal wound. As the lens rises the iris is released by tipping up the ends, and the lens is found lying in the concavity of the blades.

The simplicity with which this step in the operation is performed, the rapid and natural return of the iris to its position without further manipulation, the slight pressure required on the lower part of the cornea, and the freedom from any danger of infection renders this instrument extremely useful in the hands of a skilled operator.

To continue the steps of our operation: "The eye is now ready for the extraction of the lens, and is grasped by the fixation forceps directly opposite the section, and held steady by a careful assistant. I now take the retractor in the left hand, and with the blades closed and the set screw so arranged that the blades will open to about the diameter of the pupil, I insinuate the ends through the section to the pupillary space. The blades are now opened by pressure, and the iris drawn back and tucked beneath the edge of the corneal section. Holding it steady in that position, a slight pressure is made on the opposite side of the cornea with a spoon or hook, causing the lens to rise up and easily pass out over the ends of the blades. As it does so, and as soon as the lens presents itself at the section, the retractor is pushed slightly inward, which at once releases the iris. The retractor is then generally removed with the lens

lying in the concavity of the blades. As the lens clears away, we find the iris back in its position, not injured in any way, nor has it been exposed to the air, as may occur in simple extraction. In case there should be any cortex remaining, which I do not think will be absorbed or will interfere with the vision, I have reintroduced the retractor, and, drawing back the iris again, these masses are easily pressed out with a spoon.

This completes the operation, and the section being in perfect apposition, the speculum is removed, the eye gently closed, and the bandage applied. It is not my purpose to discuss the different methods of the after-treatment of an operation for cataract. Each operator will have his own method, from that of the old days when we kept the eyes bandaged and the patient in a dark room for more than a week, to that of not closing the eye, even with the strip of plaster; and I have no doubt that the statistics will show as good results for one as for the other. But I do feel that if the eye is protected and kept quiet until the section is healed, that results will be safer and better for the patient; so, while our first consideration may be the ultimate success of the operation, our next should be the comfort of our patient as the healing process proceeds.

Under these circumstances, it seems to me that if we close both eyes with pads of cotton and a neat-fitting bandage, there will be less movements of the eyes, and consequently less pressure on the eyeballs by the straight muscles. The slight restraint of a day or two in bed will not cause any distress, while the rest and quiet will assist in the rapid healing of the wound. Hence, I keep my patients in bed for two days, and then allow them to sit up during the day, and remove the bandage from the eye not operated upon at the end of forty-eight hours. After this, the bandage is changed every day, and the lids washed with warm water, until the tenth day, when the eye is examined.

I am inclined to think that the less we interfere with our cases, the better will be the final results; nor can I see any advantage in opening the eye until the tenth day, provided, that the appearance of the lids and the absence of pain or discomfort seem to indicate that the healing process is proceeding satisfactorily.

I have seen prolapse of the iris occur on the sixth day after the operation; and have had incarceration of the iris that I felt was due to too much interference with the healing of the wound.

But, if from any cause we may suspect that all is not going well, as redness of the lids, pain, scratching sensations, restlessness, etc., then we must not hesitate to open the eye and endeavor to correct whatever complications we may find. The use of atropine may stop a commencing iritis, or in case of prolapse we may treat it as seems best from the indica-

tions, either let it alone or cut it off, according to the extent of the prolapse.

If the operation of cutting off the prolapsed iris is necessary, I have found that cocaine will fail, and it is advisable to give ether, so as to have perfect command of the work.

In a series of fifty-seven operations for cataract, having in consideration the best interests of my patients, I have been compelled to lay aside the use of the retractor in nine operations, and use the "simple" or the "combined method;" and it has been only in these cases that I have been so unfortunate as to have any complete failures, while in all the others—now forty-nine operations, in which the retractor was used—the subsequent process of healing has been satisfactory, and the final results all that could be expected, if not better than the average.

146 E. Thirty-seventh Street, New York City.

THE USE OF SUPRARENAL CAPSULE IN MINOR EYE SURGERY.

BY JOSEPH A. MULLEN, M.D.

OF HOUSTON, TEXAS.

For the amelioration of pain and the prevention of bleeding in minor eye surgery, I desire to offer some observations of my own as well as others confirmatory of those reported by Dr. W. H. Bates* on "The Use of Extract of Suprarenal Capsule in the Eye."

The principle upon which its physiological action depends is the contractile power of the extract upon the arterioles, a vaso constricting action, thereby retaining the absorbed cocaine and increasing its contractile and anesthetic properties.

It reduces the extra-ocular tunics to a state of ischemia, preventing hemorrhage and maintaining anesthesia by keeping the cocaine locked within the tissues. Locally applied it is never followed by any constitutional manifestations, but when given hypodermatically it is, however, attended with dangerous symptoms. The face becomes livid, and there is great pain in the chest and head. These untoward effects are unmistakably due to the action of the suprarenal extract upon the small arterioles.† It also decidedly increases blood pressure.‡ Accord-

*N. Y. Med. Jour., May 16, 1898.

†Op. Cit.

‡This fact knowingly or unknowingly has been clinically utilized by Mankowski (*St. Peter's Med. Woch.*, Oct. 30th), who recommends that a solution of the extract always be on hand at chloroform narcosis. He chloroformed dogs until the circulation and respiration had ceased. Thirty seconds afterwards he injected a solution of the extract into the jugular vein, restoring them to life. (*Jour. Amer. Med. Ass'n.*, Feb. 5, 1898.)

ing to Drs. J. J. Abel and A. C. Crawford,* the blood-pressure-raising constituent is an active sulphate, a pyridine base or alkaloid.

The preparation I use is from the suprarenal capsule of the sheep, and dispensed to the profession as a powder by Armour & Co.

The solution is made by dissolving grs. v. in dr. i. of cold saturated boric acid solution and filtered. Fresh solution should be prepared for each operation. It keeps very poorly and soon becomes foul smelling. Locally its action is purely one of contraction; it enhances and prolongs the contractile effect of cocaine, after which solution it is always used. The solution is not at all irritating, but rather imparts a cooling sensation to the conjunctival membrane. A solution of cocaine 5 per cent. in strength is instilled in the eye and allowed to remain for ten minutes, after which the solution of suprarenal capsule is put in also, and in fifteen minutes the surface is ready for operation, i.e., when complete ischemia has taken place. As is well known, cocaine produces on mucous surfaces a contraction of the capillaries, while the extract of suprarenal capsule increases its action to such an extent that when the tissues are incised no hemorrhage occurs, while without the extract bleeding takes place and the anesthetic effects of cocaine pass away with the flow of blood. The action of the suprarenal on the arterioles is further supplemented by contraction of the sub-conjunctival connective tissue pulling the membrane down upon the sclerotic, preventing, even if the hemorrhage be slight, the extravasation of blood beneath the conjunctiva.

These physiological effects materially increase the clinical usefulness of the extract. It bleaches the vessels in the ptygerium and conjunctiva, making the line of demarkation between the two quite distinct, isolating the former so its removal is readily accomplished. It, however, does not immobilize the tissues so that the suturing becomes difficult. It also greatly lessens secondary swelling, and in some unknown manner kindly influences more rapid healing, so that the sutures may be taken out earlier and the parts returned to their normal.†

When using the extract for tenotomies proceed the same as in removing a ptygerium until the capsule of Tenon is reached, then instill more cocaine solution, after which the suprarenal capsule is used as before. In this way repeated testing of the muscle can be made until sufficient has been cut off for the purpose indicated. It is surprising, when proceeding in this manner, the ease to the operator and comfort to the patient with which the tenotomy is attended, and especially is it advantageous, as there is very little hemorrhage or pain.

* *Johns Hopkins Hospital Bul.*, No. 76, July, 1897.

† See article by author, "The Clinical Observation on Use of the Aqueous Extract of Suprarenal Capsule in Operations Within the Nasal Chambers." *International Clinics*, January, 1898.

The swelling after excision of ptygerii and tenotomies seems to be milder than when cocaine alone is used, especially when cracked ice is applied to the parts after the operation. When operating on the drainage apparatus of the eye, cocaine solution is first instilled into the conjunctival sac, and then a small quantity of the same solution is injected into the lachrymal sac and nasal duct. This is followed by a similar instillation and injection of the extract. Fifteen minutes after the canuliculus can be opened and the stricture of the nasal duct incised. The operation is almost bloodless and painless—a decided improvement over the use of cocaine alone. Its advantages over the use of cocaine alone are: First, to increase the anesthesia of cocaine; second, it, with cocaine, produces ischemia of the mucous tissues; third, in some kind way it modifies post-operative swelling; fourth, materially enhances rapid healing of the parts. I have never seen any evidences of cocaine toxemia when the extract had been used.*

These advantages are quite valuable, and should entitle the suprarenal capsule to a confident place on our list of medicinal substances for use in the eye.

The astringent action lasts from one hour to an hour and a half, and is followed by no injurious effects to the cornea, etc. The extract does not cause dilatation or contraction of the pupil, and is devoid of any action on accommodation; and, with Dr. Bates, I believe that within the limits of its sphere of activity, there is absolutely no other substance which can take its place in minor operative procedure on the eye and its appendages.

*Op. Cit.

A new 1898 DeZeng Refractometer for sale cheap, for cash. Address, 304 Dayton Bldg., Minneapolis, Minn.

Editor of the Ophthalmic Record.

I notice in your March issue a "Preliminary Statement" by Dr. Wm. E. Baxter of Boston, concerning a method of testing the oblique muscles. While the method of using Maddox rods for that purpose may be new to Dr. Baxter, I wish to claim priority in using Maddox rods in testing the obliques, since I have used them in a special instrument daily in my office for nearly two years, and had my perfected instrument constructed nearly a year ago by E. B. Meyrowitz in New York.

Yours very truly, Edward P. Brewer, M.D.

18 Washington St., Norwich, Ct., April 9, 1898.

REPORTS OF SOCIETIES.

WESTERN OPHTHALMOLOGIC AND OTO-LARYNGOLOGIC ASSOCIATION.

(*Continued from May Number.*)

Dr. Dudley S. Reynolds, of Louisville, Ky., read a paper on *The Science of Ophthalmology*, which appears in full in June RECORD page 285.

Discussion.—Dr. Wescott asked how many examinations are necessary before getting satisfactory results, and how is the homatropin used. Experience lead him to believe that it makes some difference as to how we use it in patients of twenty-five or thirty-five as to the results obtained. When an opportunity is given to repeat, day after day, his examinations for errors of refraction, he does not get the same results on different days, no matter how careful he is in the first examination. Atropin is used wherever possible, and he endeavors to have the patient come day after day, using a one per cent solution of sulphate of atropin two or three times a day until results are constant. He has come to be dissatisfied with his work until the last two examinations correspond. Dr. Wescott uses homatropin hydrobromate and cocain hydrochlorate, ten grains to the ounce, with one grain of salicylic acid to the ounce of sterile water. The patient introduces a drop of this solution in each eye every five minutes, and waits an hour after the first application; the amount of the refractive error is then determined with the ophthalmoscope. He uses the Risley optometer in all his work. The homatropin cases are examined a second time on the next day if possible, but one test has frequently to be depended upon.

Dr. J. E. Colburn, of Chicago: With young children, atropin is the only cycloplegic that Dr. Colburn feels any confidence in getting a result from, and two or three examinations are always necessary for a successful correction extending over a period of four or five days. With those who are trained to close observation, homatropin, used much as Dr. Wescott has suggested, gives him good results. But he is careful to examine not only once on the same day, but two or three times. If the patient can be

induced to remain within control, he makes two or three examinations under a cycloplegic an hour or so apart. When the patient is unable to give up two or three days for examination, then, if possible, he has them return for an examination on the second or third day, having stopped the homatropin, giving them the benefit of an after-examination after the pupil has contracted and the eye has resumed its functions. Then, if the patient will accept all of the correction, he is ordered it. If he will only accept a part of the correction, that is ordered with the understanding that he is to return again for further consideration in case he has any annoyance. We must consider the personal equation in these cases. A dilated pupil does not give the accurate refraction that a contracted pupil does, so that we have to consider other things in order to arrive at accurate results. Then, too, our results are going to be modified largely by the habits of patients, their habits in using atropin, the position in which they hold their eyes in reading or writing, and their occupation must be considered in giving correction. With the use of homatropin, Dr. Colburn is never certain that he is getting accurate correction, and simply uses it under protest. In the use of atropin, if properly applied and long enough, he feels, after two or three examinations, that he can get great improvement. Dr. Colburn uses, in young children, a solution of four to six grains to the ounce of homatropin, it depending largely upon the age of the patient. In the case of an adult he would use it as Dr. Wescott has stated, in combination with cocain.

Dr. A. E. Prince, of Springfield, Ill., has for ten years used a solution of homatropin in the proportion of five per cent, which is stronger than is usually recommended, adding to it a two per cent solution of cocain, not enough to disturb the epithelium, but enough to diminish the irritation of the homatropin. It requires some judgment in using homatropin in the case of children and adults. At the ages of ten years or younger, five drops of the solution are used at intervals of five minutes; at the age of twenty years, four drops at intervals of five minutes. When properly used, the same results are obtained as from the use of sulphate of atropia. His patients are re-tested with the use of sulphate of atropia, with no better results than previously found with homatropin.

Dr. Frank Allport, of Chicago, is a firm believer in the efficacy of homatropin in almost all cases. He has used homatropin in a four per cent solution for a good many years, and has rarely been disappointed in its use. He does not usually graduate the amount of the solution with the age of the patient. After a patient has passed the age of forty, more care is exercised in the use of the cycloplegic. He was not satisfied with a

two per cent solution of homatropin, and increased it until now he is using a four per cent solution, which he is quite satisfied with. A drop or two is placed upon the cornea every five minutes for half an hour, making about six applications in forty-five minutes. After the last application, the patient is considered ready for examination. Dr. Allport thinks the best effects are obtained by having the patient throw his head back, and then pulling up the upper lid and dropping the solution on the cornea itself. For the last two or three years he has been using the homatropin discs recommended by Dr. Casey Wood and prepared by Wyeth. He gets better results from the use of these discs than from homatropin in solution. A disc is placed in each eye, and the eyes are kept steadfastly closed for twenty minutes; then another disc is introduced, and in forty-five minutes from the introduction of the last disc the patient is ready for examination. When it comes to making an examination under the influence of a cycloplegic, we must be guided by the general deportment of the eye. If the examination with the ophthalmometer, upon which he does not place a great deal of reliance, and the test lens are harmonious, he feels that the refraction has been properly worked out. If there are any discrepancies, or if the patient expresses doubt in the use of the different lenses from time to time, or if they are not exact in their answers, or if they cannot tell you exactly what spherical or cylindrical lens they wish, or if they are not accurate in their axis, or there is difficulty in adjusting the axis, or the patient's accommodation is not properly paralyzed, then a solution of sulphate of atropia is used.

Dr. W. F. Coleman, of Chicago, is decidedly of the opinion that homatropin is not sufficient to completely paralyze the accommodation in clinical cases. If you say, in a physiological subject, yes, and that position was taken by Oliver, who has done more work with cycloplegics than any man he knows of. Oliver was criticised for the position he took in regard to homatropin, in answer to which he stated that he never relied upon homatropin in his clinical cases. What proof have you that homatropin completely paralyzes the accommodation? Not one could give proof except to say the results were satisfactory in correcting the error of refraction. We are perfectly astonished in hearing patients say with what glasses they have comfort. But the question is, Do we paralyze the accommodation with homatropin? To satisfy himself on this point, Dr. Coleman made a series of experiments in one hundred cases about five years ago. He put patients under a solution of homatropin in the proportion of from eight to twenty grains to the ounce, four times in an hour, and proceeded to examine them shortly thereafter. His results

were practically these, that not in more than one eye in twenty did he get full paralysis with homatropin. The variation was as much as ¼ D. in spherical error, and as much as ½ D. to 1½ or 2 in the cylinder. The axis was frequently different under homatropin. Dr. Coleman does not rely upon the ophthalmometer. It is probably correct in eighty per cent of the cases, but most of us rely upon the test lens as a last resort.

Dr. L. R. Culbertson, of Zanesville, Ohio, has used homatropin in the strength of two to six per cent with ophthalmic discs, and in about one-half of his cases in testing afterwards has found that the accommodation was not entirely relaxed. In recent years he has used the salicylate of atropin in connection with ophthalmic discs, which give a correction of about ½ to ¾ D., less than that found by retinoscopy, even stronger than that found by homatropin, and the majority of cases gave satisfaction. In recent years he has used the salicylate of atropin where the patient could spare the time to have atropinization. The salicylate has the decided advantage over the other salts of atropin in that it does not undergo changes with time. He uses Merck's salicylate and retinoscopic discs, and even if there is what he considers to be full paralysis of accommodation, he prescribes a glass according to the retinoscope disc that is spherical.

Dr. A. Alt, of St. Louis, uses the homatropin solution in the proportion of about sixteen grains to the ounce, but has found it to be extremely irritating to many patients, producing nausea in some and fainting spells in others, but in a number of cases did not succeed in getting the full cycloplegic effect. He has homatropin on his office desk, and uses it when he cannot keep a patient for any length of time and cannot use atropin, telling the patient it may be sufficient or insufficient. The question arises, Is it always necessary to have a cycloplegic effect in order to give the patient proper glasses? He has become more and more accustomed to the habit of allowing his patients to come back after the effect of the cycloplegic has passed off, and prescribing glasses that are most comfortable after reading in his office for two or three hours. Even though he prescribes weak glasses, he tells them that after a while they will be able to accept a stronger glass. He thinks patients are much more satisfied, and it is an excellent thing for them to become accustomed in learning how to use full correction for astigmatism, as well as hypermetropia, than to be worried for one or two months, and then be satisfied. They are better satisfied if they will take a stronger glass later on.

Dr. A. E. Bulson, of Fort Wayne, Ind., has always used homatropin

very thoroughly; but the discs manufactured under the formula of Dr. Casey A. Wood have been preferable, and has used them every five to ten minutes, and instead of using four in an hour has used from six to eight in an hour and a half. He supposed that he got complete suspension of accommodation or a cycloplegic effect; but during the past year several patients whom he had previously examined returned, and were examined under atropin, finding that the effect of homatropin used at a previous examination had not been all that he supposed it was. He has used homatropin in many hundreds of cases, and he was a staunch advocate of it for several years; but does not believe that it is applicable in all cases, as Dr. Reynolds maintains. He fully believes that in seventy-five per cent of the cases it is sufficient, but that in the other twenty-five per cent it will utterly fail in its purpose. We too frequently prescribe a glass that is too strong for the patient and decidedly uncomfortable. He believes this is a very sad mistake in a large number of cases, and that the patient, instead of being benefited by the glasses, and instead of wearing them, will lay them aside on account of the discomfort in becoming accustomed to them. He was criticised very severely for a paper presented at one time to the effect that he gave partial correction in cases of hypermetropia, and was accused of being half-way in his treatment; nevertheless he believes this half-way treatment in some cases is far preferable to giving patients the full correction. He would, therefore, strongly condemn the practice of giving full correction when a patient admits that it is too uncomfortable for first wearing.

Dr. C. Barck, of St. Louis, Mo., said that the older he gets the less frequently does he use cycloplegics. He would like to say a word or two in favor of a method which has not been mentioned to-day, namely, the direct ophthalmoscopic examination. In a large number of cases the accommodation relaxes entirely in the dark room under examination with the ophthalmoscope. This is all right if the examiner can relax his own accommodation and can rely upon his own relaxation. The younger members of the profession do not use this method as extensively as we do, simply because retinoscopy is easier to learn for the beginner. It would be a good thing if this method was practiced more. He never uses cycloplegics in patients above 40 years of age, but uses it in persons between 25 and 40, and uses it most frequently in children, and especially in those cases where there are indications of spasm of the muscles of accommodation. In the latter instances he prefers the use directly of atropia instead of homatropin. In young persons glasses will be rejected,

and we must be guided by the age of patients, and in this connection referred to the table of Hirschberg.

Dr. B. E. Fryer, of Kansas City, Mo., does not believe that in the majority of cases we can get complete paralysis of accommodation with homatropin, and agrees with what Dr. Colburn has stated regarding its use, because we cannot get patients to wait long enough. Scopolamin is a satisfactory cycloplegic, and it does not dilate the pupil under its full effect so much as it acts on the ciliary muscle. We have a minimum, so to speak, of dilated pupil, and a maximum of cycloplegic effect. One other point, he thinks, is important. In giving people glasses, it is very essential to find out their muscular conditions and to make the lenses center. We may produce a distressing condition from improperly centering the lens. He uses one-fifth of one per cent solution of scopolamin, dropped into the eye two or three times. Occasionally you may get a toxic effect in young people, but care should be taken that it is not used too strongly.

Dr. Reynolds (closing the discussion): Dr. Reynolds has a fresh solution of homatropin make-up each time he is going to use it in the proportion of one grain to the dram. No cocain is used with it. The patient is brought into his office and a drop of the solution is dropped into each eye, the upper lid being raised and the solution allowed to fall upon the cornea; this is done about every minute, until ten applications have been made. Then, at the end of forty-five or fifty minutes, he begins the test with the use of Risley's optometer. An obscuring opaque disc is used for the purpose of covering one eye, insisting that the patient keep both eyes wide open. The patient is made to read what he can with the uncovered eye. If he can read down to about the fourth line from the bottom, Dr. Reynolds concludes that about 1 D. and ½ + hypermetropia is present. If that does not correct the error of refraction, he is asked to read the last line of the card backwards; then Donders' opaque disc is placed before the eye. It is placed vertically, and the patient is asked what he sees. If there is no discrepancy at all, he looks through the center of the slot. Then a series of lenses are prescribed, always preferring to begin with something the patient will require, and after having made an analysis of the refraction, he is able at once to determine whether there is suspension of accommodation. If the patient can see apparently as well with one glass as another, he is sent back to have the solution dropped into the eyes three or four times more, and after thirty minutes the test is again made. In about ninety per cent of the cases, homatropin, when used in the manner as suggested, will answer

the purpose. It can be used in too great strength, and the interval after the last application can be too much extended, or you may approximate it. In persons whose accommodation is thoroughly paralyzed by the first series of applications of drops, and in many other persons in whom it has to be repeated, in something like ten per cent of the cases after thirty years of age, it becomes necessary to prolong the applications from day to day, or substitute for homatropin, sulphate of atropin, and he has scarcely determined in his own mind which is the better plan. Sulphate of atropin does not always succeed. It utterly failed in his own eyes. It develops irritation, which prevents suspension of accommodation. Sulphate of atropin is not an universally accepted cycloplegic. Homatropin, used in the manner stated, comes the nearest to fulfilling all requirements. He finds in persons above sixty years of age there is still considerable accommodative power present. In his own eyes he had no manifestation of presbyopia. Within the past year he has been obliged to add a spherical plus lens to his cylinders 3¼ D. axis 90° combined with ¾ D. sphere. Dr. Reynolds has never had constitutional manifestations from the use of hydrobromate of homatropin in children. In young ladies he has occasionally had serious nervous disturbances following its use, but the element of hysteria was too conspicuously apparent to justify the suspicion that the effect was due to the drug. He has known four grains of sulphate of atropia to the ounce of distilled water produce toxic effects in a robust adult, not once, but many times. It flushes the face and quickens the respiratory movements. These symptoms pass off after a while, and when the acute manifestations, with disturbance of the cardiac and respiratory centers, have passed away, then the cycloplegic effect is supposed to be present. He has no occasion to make any change in the strength of his solution, or to follow the method of varying the strength of the solution, as between children and adults, excepting in persons above forty, in whom there is no strong hypermetropia. He directs the applications to be limited to half a dozen instead of ten, about a minute apart. His experience with the use of cocain is that it frequently gets into the fauces and produces discomfort and sometimes alarming symptoms, and renders the cornea more or less opaque. It is, therefore, objectionable. The question of correct adjustment of the lens is of much importance. He has had great difficulty in past years in getting frames made with deep enough nasal curve on the one hand, or large enough at the base on the other hand, of the proper form to enable the patient to wear them in a fixed and constantly satisfactory position. Dr. Reynolds is opposed to partial correction of the error, excepting for those who have hypermetropia and

hypermetropic astigmatism. He requires the patient to read with glasses with united parallel lens, they using any modification they please for distance.

Extraction of Immature Senile Cataract. By C. Barck, of St. Louis, Mo.—The current view of the necessity to wait for the so-called maturity of senile cataract needs to be modified. The lens, after the age of 55 to 60, is coherent enough, no matter how small the opacity, to admit of a complete and easy delivery, if the corneal and capsular sections are large enough. This opinion was first promulgated by Hirschberg, of Berlin, in 1892, but bitterly opposed. The experience of the author, based upon dissections and operations, coincides with the teachings of Hirschberg. He reports ten cases of extraction of immature cataract in different stages, in each of which the operation was just as easy and complete as in mature ones. The conclusions of the paper are; (1) A senile lens, however small the opacity may be, is coherent enough to admit an easy extraction *in toto* by the proper method; (2) to wait for the so-called maturity is unnecessary. The operation can be performed as soon as the sight is impaired to such a degree that the vocation or comfort of the patient is interfered with; (3) all operative procedures for artificial ripening are unnecessary and are contraindicated, exposing the eye to a twofold danger.

Discussion.—Dr. A. Alt, of St. Louis, agrees with Dr. Barck in regard to the possibility, and sometimes even the moral, demand, of extracting immature cataracts, and in a number of cases has extracted these cataracts that were more advanced. The first case in which he extracted an immature cataract was in a man fifty-nine years of age. He operated on him with success, and he returned to his business. He is fully in accord with Dr. Barck, that in people of from fifty-five to sixty years of age immature cataracts can be extracted very nicely, sometimes as perfectly as a mature one without leaving any substance behind. In some cases he has had better results from the extraction of immature cataracts than if he had waited longer. The patients are usually younger, are healthier and more active, and the recuperative powers are greater.

Dr. Dudley S. Reynolds, of Louisville: The subject of extraction of immature cataract is one of great interest. He has a professional brother who has had a zonular cataract for many years in the left eye. The entire posterior surface of the lens seems to have been opaque for more than a year, while in the anterior portion of the lens there is a little opaque matter limited to the anterior fold. In the nuclear part of the lens is a mass resembling a snow-ball in whiteness, surrounded by normal transparent

lenticular substance. The question arises, Shall the lens be extracted? As you know, in many cases of lamellar cataract the capsule participates. We have capsular opacities before the lens is involved by the opaque change. He thinks that as long as a person has the capacity to read with the fellow eye, it should be let alone. The moment he is not able to read with the other eye, an extraction should be performed, with the understanding that almost certainly a subsequent needling operation of the opaque capsule might be safely undertaken. He would not care to extract such a lens through a dilated pupil, but would prefer to supplement it by an iridectomy. In the extraction of immature cataracts, whether zonular or nuclear, the operation should not be done through a dilated pupil, because it is certain that a large amount of cortical substance of the lens may be present in the capsule, or attached to it. No harm will result if the amount of it is not large, and if the eye is protected by an iridectomy. He is sure that if this be not done there will be some harm done to the ciliary region, and bring on an attack of glaucoma, and a glaucomatous attack after the extraction of an immature cataract is a dangerous complication. It will not occur if the extraction is preceded by an iridectomy.

Dr. Barck (closing the discussion): As to iridectomy, he stated that in all of his cases an iridectomy has been performed, and he has never gone so far as to remove an immature cataract without an iridectomy.

Multiple Angio-Sarcoma with Metastasis Into the Orbit and Other Regions. By H. V. Würdemann, M. D., of Milwaukee, Wis. Female æt. 5 years 7 months. Family history good, excepting grandfather, on maternal side died of carcinoma of the stomach. Personal history good, excepting intestinal indigestion due to ill-advised feeding. Was first seen in October, 1897, with considerable exophthalmos of left eye, down and out, caused by an irregular growth at upper and inner angle of orbit, which was nodulated and gave evidence of fluctuation; lid was slightly ecchymosed; ophthalmoscope showed only slight congestion of retinal veins. No evidence of diplopia; vision not obtained. Physical examination showed nothing else abnormal. Growth removed, consisting of a dark cystic mass the size of small walnut; was friable and subperiosteal, exposing denuded bone; wound healed rapidly, all evidences of exophthalmos and strabismus disappearing. Was seen again in December; eye protruding more than before, an enlargement at left temporal prominence, and one at junction of sagittal and coronal suture on right parietal bone. The right hypogastrium protruded, and a tumor of liver was thought to have appeared. No complaint of pain was

made; was disturbed only by indigestion. Ophthalmic examination of eye showed nothing; no diplopia was discovered. Unfavorable prognosis was given and child sent to Children's Hospital. Weight, 30 pounds; temperature, 99.6; pulse, 120. Fed per rectum on peptonized milk for three days. Temperature became normal and pulse 100. Then was fed by mouth. Mental condition good. Blood count showed 3,500,000 red; white in proper relation. 0.30 gm. of potassium iodid was given three times a day in milk, without disturbing the stomach. January 3d had muscular cramps in legs at intervals, lasting three days; no complaint of pain otherwise; on general diet, with good appetite. February 10th, weight 32 pounds; abdomen large, body cachectic. Played with dolls, and noticed everything. Solid food refused; milk and ice-cream taken in small quantities; vomited easily; food apparently unchanged. Left eye-ball became inflamed, vitreous first becoming turbid, then cornea opaque, rapidly softening; dressed with moist 25 per cent. glycerin and boric acid dressing. February 17th, weight 32 pounds, abdominal growth and tumors on head and in orbit greatly enlarged. Cornea sloughing slowly. Temperature 98 to 99; pulse, 100 to 120. February 23d, died after a short period of unconsciousness. Post-mortem: Tumor size of egg on left frontal prominence, one size of orange on right parietal bone; left eye pushed forward and down between lids by tumor size of a lemon in orbit. Tumor occupying epigastrium, right hypogastrium and part of left hypogastrium, extending as high as fifth rib on right side; body extremely emaciated. Organs in thorax normal; left kidney normal; right imbedded in mass of tumor. Superior portion having two indented facets produced by pressure; rest of kidney normal. Super-renal capsule surrounded by mass which was cystic and degenerated in its neighborhood; spleen normal, but pushed upwards; jejunum, ilium and large intestine normal; liver, stomach, duodenum, pancreas, mesenteric glands and aorta all massed together. Liver flattened to 3 cm. in thickness, and closely adherent to superior portion of neoplasm. Main growth covered by peritoneum is lobulated, attached to gall bladder, lesser curvature of stomach, mesenteric border of duodenum and connective tissue surrounding aorta. Common duct greatly elongated; walls of stomach and duodenum not thickened; pancreas much enlarged and connected with a cyst at its head filled with whitish semifluid. Frontal tumor firmly attached to skull, periosteum destroyed. Parietal tumor covered with periosteum, dura firmly attached to calvarium under tumors. Bone tissue destroyed. At anterior base the gyrus rectus, lobus olfactorious, gyrus frontalis inferiors destroyed and softened on the left side as far as

fissure sylvius, and 2.5 cm. into frontal lobe. Gyrus rectus and lobus olfactorious partially destroyed on right. Brain otherwise normal. A tumor firmly attached and involving roof of left orbit and dura mater; bones forming the rood partially destroyed. Left eye surrounded by grayish-white tumor size of large walnut, filling whole of orbit. Optic nerve enlarged. Lachyrmal gland enlarged about ten times its size and black in color. Right eye normal. All evidence indicates neoplasm began in connective tissue of right kidney and extended upward into the liver, the surrounding tissue becoming involved by metastasis. Microscopic examination shows typical angio-sarcoma in all involved organs.

Discussion.—Dr. A. Alt, of St. Louis, Mo., was somewhat astonished to find that Dr. Würdemann does not consider the orbital tumor the primary one. Usually in these cases the orbital tumor is first, and the others are metastatic tumors. As long as there were no physical signs of disease of the abdominal organs when he first saw the case with orbital tumor, and unless there are good grounds for believing that the original seat of the tumor was in the abdominal cavity, it seems to him the orbital tumor was, after all, the primary tumor. Every one who has had opportunity to see such cases of orbital sarcoma knows that it is useless, so to speak, knowing the final outcome of these cases, to operate, unless by examination of the orbital contents we are able to remove all of the diseased tissue by an early operation. He has reported a case similar in nature, in which he operated on a primary tumor in the orbit. He thought he would be able to remove all of the diseased tissue, and yet within three months after operative interference a large tumor recurred, and at this time he refused to operate. The patient then went from his hands into those of a Christian Science healer in St. Louis, and he has been informed that a short time thereafter metastasis occurred in the abdominal organs and the patient died. So far as his acquaintance and knowledge with these cases go, usually the seat of the tumor is the orbital tissue, and the tumors which develop in the abdominal cavity are secondary tumors from metastasis.

Dr. Würdemann (closing the discussion). This case is probably unique, because of the angio-sarcoma appearing in a very young child, and also that it appeared in the connective tissue back of the kidney, rather than in the connective tissue elsewhere in the body. He has had another case of small round-cell sarcoma, non-pigmented, in which the eye was enucleated for inflammation, with no other diagnosis having been made. The patient, a lady 51 years of age, was brought to him later with a tumor having developed in the orbit, about the size of an eyeball.

Total exenteration of the orbit was done, and at the time there was no involvement of the glands, the liver or any other part of the body. The optic nerve was divided close to the commissure, and it cut like celery. At the microscopical examination, cells were found infiltrating and involving the edge of the optic nerve. Recurrence did not occur in this case for two and one-half years. The disease finally recurred in the liver, and was found in practically all the lymphatic tissue of the body. Recurrence took place in the orbit, but in the glands close by the tear duct. The patient finally died of inanition. The cause of death in the child was meningitis.

Dr. A. R. Amos, of Des Moines, Iowa, read a paper entitled *Hemianopsia, Followed by Total Loss of Vision in Both Eyes as a Result of Uterine Hemorrhage from Fibroid Tumor.* A woman, aged 50, who had always enjoyed good health previous to the onset of a uterine hemorrhage, which occurred nearly a year prior to any visual defect. No history of syphilis or tuberculosis, and no inherited tendency to brain disease. The uterine function had always been satisfactorily performed. During the period from the first hemorrhage to the complaint of visual defect her system had sustained frequent losses of blood from the uterus. Examination of central vision showed it to be above 20/30 in both eyes. The perimeter revealed a full field on the left in both eyes, as well as good color-sense, but visual perception from her right field was abolished. The pupil reflex and accommodative power were retained. Ophthalmoscopic examination negative. No apparent paralyses of other nerves. The patient was irritable and fretful. The extreme pallor of patient caused inquiries as to hemorrhage. Suspecting uterine tumor, the patient was at once referred to a surgeon with the assurance that the eye affection resulted from loss of blood. Accordingly, she was operated on by Dr. Etheridge, of Chicago, shortly after which vision remained about the same as when the essayist had last seen the patient. Within three days following the operation she was again attacked with dizziness, and became totally blind. In closing, the author called attention to the following points: 1. The two lesions occurring at different periods of time, and involving the same portion of each cerebral hemisphere—double homonymous lateral hemiopia. 2. While at first there was loss of central central vision as well as peripheral, regeneration of the area connected with the macula lutea of one or both sides had taken place, leaving the other areas still implicated.

Discussion.—Dr. L. R. Culbertson asked Dr. Amos whether he tested

the light reflexes on each half of the retina, and whether it was a dark light reflex or a reflex on each lateral half.

Dr. Amos (closing the discussion): In reply to Dr. Culbertson, said that the light reflex following the first attack, namely, when he found the homonymous hemiopia, was tested in the dark room, the light being projected only on the blind side, or that part of the field of vision that was found to be sightless. In this test the pupillary reflex was found to be present. There was double homonymous hemiopia even at the time he first saw her, although no history of central vision was given. The pupillary reflex was present to light placed before a window, and seemed to be perfect.

Dr. L. R. Culbertson, of Zanesville, Ohio, read a paper on *Rotation of the Axis of Astigmatism During Ophthalmometric Examination*, and reported three cases.

PRESENTATION OF CASES, MICROSCOPICAL AND PATHOLOGICAL SPECIMENS, AND NEW INSTRUMENTS

Dr. A. Alt, of St. Louis, Mo., showed under the microscope a tumor affecting the ciliary process, accidentally found in the eye of a patient who died from pneumonia. He discovered in the other eye the same kind of tumor, affecting another ciliary process. The nature of the tumor he was not sure about. It looks, at a superficial glance, as though adenomatous, but on examining it with a high power one sees a number of spindle cells arranged in double rows, and between them a gelatinous substance something like the tissue of the umbilicus. It resembles a gumma, but probably is not one, because there is no small cell infiltration around it; perhaps it is a congenital tumor.

Dr. Alt showed under a low power a number of cells of trachoma, which he considers the parasitic organism which causes this disease.

Dr. Alt also showed a section of lamellar cataract nucleus.

Dr. Casey Wood, of Chicago, presented four surgical cases—the first as a problem, and asked the advice of the association as to its treatment. The first symptom that the patient, a strong, healthy man, aged 47, with no constitutional disease, manifested was that of unilateral neuralgia, apparently supra-orbital, which was very severe and lasted for many months. Patient was treated by different methods without any beneficial result. A short time before the orator saw him an abscess formed immediately above the eye, and broke through the skin a little to the outer side of the region of the supraorbital notch, and a fistulous opening has since persisted. Following the breaking of the abscess he got some relief from the supra-

orbital neuralgia. Dr. Wood found the remains of an eccondrosis of the septum opposite the center of the middle turbinal bone, which had been operated upon quite recently, and although it gave him some relief so far as the nasal symptoms were concerned, had not been removed sufficiently early to relieve the patient's distress or prevent the lesion under consideration. From the fact that there was long continued, unilateral, supra-orbital pain, followed by orbital abscess which, on discharging, gave relief to the symptoms, Dr. Wood believed that he had to deal with empyema of the frontal sinus. Before seeing the patient the sinus and the abscess behind had been treated by all sorts of solutions and powders without avail. Following the advice of Kuhnt, an incision was made in the central line, following the nasal crest; another, continuous with this but at right angles to it, followed the brow. The skin and periosteum were turned back, exposing the bony parts at the internal angle, and with a large trephine the frontal sinus was entered. Pus flowed out, some granulation tissue was found in and removed by the curette from the frontal sinus. This opening was kept free as long as possible, was frequently irrigated, and then packed with iodoform gauze. A retro-ocular abscess now remains. The fact that the patient lost the other eye years ago rather complicates matters, as one naturally hesitates to do certain things that he would feel like doing if the patient had two good eyes. In attempting to heal the abscess a large aneurism needle was passed through the sinus, deep behind the globe, and brought out a little more than half an inch towards the nose, a counter puncture being made at the latter site and a large drainage tube inserted. This was retained in place as long as possible, but healing apparently taking place from the bottom, the drainage tube was eventually removed. The patient still has a slight, occasional discharge from the opening, but not very much. His symptoms are entirely relieved, but still this leaking keeps up. It is not reasonable to expect in this case complete closure of the fistulous tract inside of three or four months. If not cured then, Dr. Wood proposed to reopen the frontal sinus and drain the latter through the infundibulum.

Removal of the lens for high myopia. — Removal of the lens for high degree of myopia is not as common an operation in this country as it doubtless will be, and it is not for obvious reasons, as frequent here as in Germany. The case exhibited is probably the first operation done in this country, having been reported in the discussion of Dr. Harlan's paper before the *American Medical Association* some years ago. "The case is as follows: March 2, 1891, A. M.,

seamstress, seventeen years old, been myopic for eight years, lately getting much worse. Could not go to school, and now unable to do any sort of work. If she attempts to sew, her eyes ache, and feel as if they were bulging out of her head. Glasses make objects brighter, but do not otherwise help—V. R.=fingers at seven feet, with —14 D.=20-100. Skiascopy confirms this finding. V. L.=fingers at eight feet, with —15 D.=20-70. There are sharp temporal crescents of about ½ d. d. in width in both eyes. No choroiditis, although the choroidal vessels can be readily seen over the whole background. Macular regions show as cherry red spots. March 3, 1890, needled the right lens, a small central opening. Used atropin and hot water to relieve subsequent pain. In a week, tension with pericorneal injection and pain. Made a corneal opening and removed most of the lens. Did two subsequent needlings. August 5th, V. R.=20-100. The pupil is irregular and attached to pupillary membrane. In December needled left lens without mishap. The lens absorbed nicely, V. L.=20-100. With L. 90°+.50+4=20-50, and with 90°+.50+8=J2. Did not order lenses for right eye, although with this correction on left side patient was able to read and do other near work and eyes were comfortable. I did not see her again until March of this year, when the following condition was observed: Secondary cataract, V. R. fingers at 5 and no improvement. Left membrane needled and with 90°+.75+2.50=20-50, and 90°+.75+6.50=J2. Two weeks later did a De Wecker's capsule-scissors operation, after which patient obtained 20-50 vision and could read J2 and do near work without trouble."

The improvement in this patient's case has gone on until now she has no trouble whatever with her eyes. She has no headaches or pains, and is able to use her eyes indefinitely for all kinds of work.

In connection with this case another was shown—a case of monocular myopia of 13 D., with marked asthenopia. This healthy girl's (æt. 16) left eye is practically normal, but in the right eye there is a high degree of myopia. The elongated axis on the right side can be seen very easily as the patient looks to the right. What is one to do in such a case as this? Glasses have not been of any use at all. Both partial and full corrections have been ordered, and all sorts of treatment given, and still she is practically unable to use her eyes for more than a few minutes at a time. The myopic eye shows no destructive fundus lesions. No relief followed the wearing of glasses. There was no relief from non-operative interference. The fundus is practically normal, and there are no choroidal changes to speak of. In operating on this patient all precautions were

taken. Although limited in experience of these cases, Doctor Wood agrees with Fukala that one should be very careful about the first needling. He had trouble in the first case where, owing to want of care, fully one-half the lens came forward into the anterior chamber. The first discission in the second instance was done six days ago, and although one can see small shreds of the lens projecting into the anterior chamber, there has been very little reaction.

Surgical Treatment of Anterior Synechiæ.—Anterior synechiæ, whatever their origin, are, as a rule, in this country left alone. In a certain class of cases, where it is possible to interfere successfully and easily, Doctor Wood uniformly cuts through the incarcerated iris, and exhibited a patient, a child, for the purpose of showing the usual procedure in such cases. Where there is a space between the synechia and the iridic angle he has been in the habit of separating the iris from the cicatrix, close to the cornea, by means of Lang's "twin" knives. One is a blunt-pointed and the other a sharp-pointed bistoury. The sharp-pointed bistoury is entered in the true cornea near the limbus, as far away as possible from the site of the synechia, and when withdrawn no aqueous is lost. Through the opening thus made the blunt-pointed bistoury is carefully introduced, passed behind the imprisoned iris stretched across the anterior chamber, and the latter abscised. The operation is simple, and because of its simplicity should be more generally practiced. In this case the penetrating wound of the cornea tore a portion of the iris, so that there was an opening through the mass of the iris itself, and quite a large portion of the torn piece presented through the cornea. Having dealt with the case in the manner described no reaction whatever followed, and the present state of the case is certainly much better than if the synechia had been left.

In answer to Dr. C. D. Wescott, Doctor Wood said that he had never used these knives in cases of complete occlusion of the pupil, although he had seen Lang do such an operation with success.

An Operation for Partial Advancement.—In the patient presented the operation was done on the left external rectus. She had marked esotropia, with red-glass diplopia, vertigo, etc., and was able to fuse a candle light at twenty feet for a few minutes only. A needle armed with a singlebraided-silk thread is passed beneath and through the lower edge of the tendon as near the cornea as possible and firmly tied with a double knot, leaving a suture end two inches long. It is then passed beneath the conjunctiva for a distance of 3, 4 or 5 mm. (according to the effect desired), along the lower border of the muscle, and out again through the conjunctiva. The

needle is now carried into and out of the body of the muscle (through capsule and conjunctiva) until it reaches the superior border of the rectus. It is then carried along this border to a point opposite the original knot, and hence, as before, across the muscle (or tendon) to the point of starting. The patient is told to look outward as far as possible, the suture is drawn taut, and the purse-string operation is complete. Doctor Wood advises the simple procedure in most cases where a partial advancement is indicated. There is usually little reaction, and no section of the tendon opposing, although resort to this additional procedure may, of course, be had. Four weeks ago the eye presented a decidedly bloodshot appearance after the operation, but at present it looks well; the visual result is excellent, and the ocular symptoms have disappeared.

In reply to Doctors Coleman and Colburn, he said that he would do this operation in almost all cases where one would not do section and advancement at the same time, but where one could reasonably expect to get some results from advancement alone. In answer to Doctor Alt, he replied that the suture may be left in ten days.

Dr. J. E. Colburn said that some years ago, at the Cincinnati meeting of the American Medical Association, he reported an operation similar to this, and devised a double hook for raising the muscle, being sure that he had the muscle in grasp while making the operation, as the Doctor has done; but although he had made a few such operations and obtained good results, the reaction was so great in some of the cases, and the recovery so slow, that he made up his mind that advancement with section was the preferable procedure. He never went further than to call attention to the operation at that time.

Dr. J. O. Stillson, of Indianapolis, Ind., said that he saw Doctor Jackson do an operation for excessive myopia similar to the one described by Dr. Casey Wood, the case having been presented to the Philadelphia Medical Society. Doctor Jackson passes the needle in not far from the limbus to the center of the cornea, making a small capsular incision. This allows the lens to come forward, and, using the cornea as a fulcrum, and without enlarging the opening in the capsule, makes extensive trituration of the lens inside the opening. After triturating the lens well he withdraws the needle, and in this way gets more rapid absorption without the risk of allowing the soft lenticular substance to come out into the anterior chamber. The aqueous is secreted very soon, and the anterior chamber is re-established, so that he does not get, as he claims, any great amount of irritation or reaction. The results of this and other operations were very gratifying. Dr. Charles H. Beard, of Chicago, always does discis-

sion with a small Graefe knife, not with a needle, entered near the sclero-corneal junction. In making one's first needling, Doctor Wood is quite right in saying that one should not attempt to do too much; merely prick the anterior capsule. The Graefe knife is of great advantage over the needle from the fact that one can make a slanting incision, barely lifting up the capsule with the point of the knife, and quickly withdrawing it. Afterward, when it comes to another needling, one may enter more boldly, and insert the knife deeply into the lens substance. Certainly the old method of needling, by means of Bowman's needle plunged through the cornea, is a very dangerous procedure. I would do this operation with more fear and trembling than make a cataract extraction. I have seen serious results from needling by Bowman's needle, because by so doing little shreds of the capsule are easily drawn out into the small opening made by the needle, which serve as foci of infection. Dr. David W. Stevenson, of Richmond, Ind., had, in China, done about a dozen of these needling operations for high myopia, and reported the case of a patient so treated who obtained useful vision, although his refraction was —18 D. A large proportion of the Chinese are short-sighted, because the print is so bad, and oculists who wish to do this operation can have many opportunities of doing it in China. He frequently used the suction apparatus to hasten the matter somewhat after needling. Dr. A. Alt, of St. Louis, Mo., had performed a number of these needling operations, and placed on record one or two cases. One of these was a man who was utterly unable to do near work with or without glasses. He had compound myopic astigmatism. The first case operated on turned out beautifully, so that the man had normal vision. His astigmatism disappeared after the operation, and he read with a +3 D. With a comparatively weak spherical lens he could do all near work. He was a young man, so that previously he could not go to school on account of the condition of his eyes. He had no education to speak of, but was eager to get one. With one eye vision was so good that he went to school and prepared himself for business, which he is now carrying on. About nine months after this he came back and asked to be operated on in the other eye, which was affected by choroidal disease and dislocation of the lens. This time too thorough needling was done, and the eye was ruined by detachment of the retina. Dr. E. A. Kegley, of Cedar Rapids, Iowa, reported the case of a young man, twenty-three years of age, who came to him wearing a 16 D. concave glass. He had been trimming osage orange, and had been injured in the eyes by one of the thorns, the lens becoming opaque. It was needled three times, and

within six months he began to pursue his studies in college without the use of any glass.

Dr. Casey Wood, in closing the discussion, agreed with the remarks of the various gentlemen regarding needling, and did not think it was quite such a simple operation as it is usually considered to be. It is regarded as a trifling procedure until one gets a serious reaction following it, and probably a lost eye. He prefers to use a needle in this operation, but a needle that closely resembles a small, thin Graefe knife. It is very important in this operation not to trifle too much with the lens, and he remarked that the lesson he received in the discission of the first eye for excessive myopia was one that he had not forgotten.

A Case of Optic Atrophy Following Injury Much Improved by Electricity. —Dr. W. F. Coleman, of Chicago, presented the following case: Mr. B., age 61 years, was struck by a piece of scantling, forty-five pounds in weight, on the forehead, in August, 1896, rendering him unconscious for ten minutes. He resumed work in a week, but felt a sense of intoxication in his head. Two weeks later he fell from a wagon and struck the back of his head but was not rendered unconscious. He has had thirteen children, ten of whom are living. His wife had one miscarriage from overlifting. He gives no history of syphilis or other disease. Has had no cerebral or spinal symptoms. Smokes three pipes a day since eighteen years old; takes one glass of liquor a day. The field of vision, taken four months after treatment began, showed concentric contraction for each eye of 10° in the whole field. Color vision: The right eye confuses purple with gray and gray with blue. The left eye confuses purple and green with gray and gray with blue. Before treatment. Vision right eye = fingers at twelve feet slowly. Vision left eye ditto. Fundi showed advanced optic atrophy of the temporal side of both discs. The choroidal pigment was thinned on the temporal side of each disc. The retinal vessels appeared normal. Treatment: He was treated for three months at the *Illinois Eye and Ear Infirmary* by strychnine injections and internal medication, but vision continued to fail. The diagnosis, as told the patient, was optic atrophy. Prognosis unfavorable. For a month previously was treated at the *Hahnemann Hospital.* Diagnosis and prognosis the same. Treatment: The patient has been treated at Doctor Coleman's clinic, the *Post-Graduate Hospital.* Galvanism has been used for five minutes daily, the cathode to the closed lids of each eye, and the anode to the nape of the neck with a current of 5 m. a. After four months' treatment: Vision, each eye = 6/18. With + 4.50s each eye = .05 Sn. at 10 to 14 inches. The discs show much more color than

at the first examination. Doctor Young, of Zanesville, Ohio, thought it would be well for members of the association to examine the eyes of Doctor Coleman's patient. Personally he failed to see on what basis a diagnosis of optic atrophy has been made, inasmuch as there was no appreciable diminution in the caliber of the blood-vessels, and no cupping.

NOTE.—The patient has not applied for or recovered damages on account of the injury at any time after the beginning of the treatment. We state this so as to exclude the psychological effect of improved finances upon the vision.

Discussion on Dr. W. A. Fisher's case of *Bilateral Abducens Paralysis*, published in the May number of the OPHTHALMIC RECORD.

Dr. A. R. Amos, of Des Moines, Iowa, did not think it necessary to assume that paralysis of the abducens is the primary cause of the position of the eyes, since a force sufficient to draw the eyes in and hold them as they are now being held would be sufficient to overcome antagonism of the external recti. Even a contracture of the external muscle would hardly account for the condition that is present, and one must account for it rather on the basis of contraction of the fibrous envelopes of that region. The slight ptosis which is present might be present with this condition at the same time. The external recti are paralyzed from long continued stretching, and with the weakness incidental to the paralysis the eyeballs drop forward. It is a process not unlike that which takes place in chronic diseases of fibrous connective tissue elsewhere.

Dr. Thomas Faith of Chicago, showed a *Peculiar Case of Paralysis of The Ocular Muscles* in a man aged 51, unmarried; nationality, Belgian; family history, negative.

Previous history: When nine years old patient had epidemic dysentery; malaria at the age of thirty. He had gonorrhea at fourteen; has had enlarged glands in the groin at times. Indefinite history of some skin trouble which recurred several times, but disappeared always on taking a brisk cathartic. Had a sunstroke in 1894, which has incapacitated him for hard work, particularly in warm weather. History of eye trouble: Has central leucoma in both corneæ, which has been present since the patient can remember. Has had a tendency to divergence in the right eye for the last seven or eight years, which has grown gradually more marked since 1894, the time of the sunstroke, up to 1896, since which time it has remained stationary. Patient has some evidence of having had syphilis, namely, some cervical adenitis, and what appears to be the remains of a mucous patch in the mouth. Present condition is, paralysis of the internal rectus, superior rectus, inferior rectus, and superior oblique of the right eye. The eye remains, when at rest, in a position of divergence. If directed to look to the left, the eye can only be brought inward as far

as the median line. Comparing it with its fellow of the opposite side, and directing the patient to look downward, it is seen to fall behind. The same is true when he is directed to look down and to the right; but when he is directed to look up, instead of the eye moving directly upward, it moves up and to the right, which is easily done when the patient is directed to look in this direction, showing that the inferior oblique and external rectus are the only muscles which are acting. The lesions causing the paralysis in this case is difficult, if not impossible, to locate.

In the case under consideration we have the fourth nerve involved, the branch of the superior division of the third, which supplies the superior rectus, and the branches of the inferior division, which supply the internal and inferior recti, the third branch, or that going to the inferior oblique and ophthalmic ganglion, being unaffected. It does not seem probable that it is a central lesion, from the fact that we have no paralysis of the inferior oblique, no paralysis of accommodation, no dilatation of the pupil, and no ptosis, though Meyer states that if the cause is situated in the central parts or near the origin of the nerve, the disease must be very extensive to involve all the fibers of the nerve, and paralysis of the fourth being present in the case, favors the theory of central origin.

The above points would tend to indicate that this case is one of chronic ophthalmoplegia of central origin, though the lesion may be a peripheral one, and Dr. Faith has thought of the possibility of it being due to some periosteal inflammation, growth or gumma along the inner wall of the orbit, near the apex, and causing pressure upon or involving the four muscles which pass nearer to the inner than to any other wall of the orbit, and are the muscles which are here involved. Whatever may be the location of the lesion, the paralysis is surely a peculiar one, and is probably due to syphilis, as benefit has been obtained from the use of iodides. Dr. Robert Tilley, of Chicago, said the patient informed him that he was perfectly well before he sustained two accidents, one in the front of the head, and one on the back part of the head. The injury in the back part of the head, as he described it, seems to be situated in what is supposed to be the cortical region for vision, and there is a marked depression in the skull. It is always interesting to try and find out, if possible, something regarding these injuries. Dr. Tilley had seen so many cases where atrophy of the optic nerve followed injuries about the head. There is undoubtedly the appearance of atrophy in the left eye, on the temporal side.

Dr. H. V. Würdemann, of Milwaukee, showed two specimens mounted in formalin-gelatin, one of albuminuric retinitis, and another of hem-

orrhagic glaucoma. Some of the specimens shown had been in gelatin for several years, and were still in a good state of preservation.

Non-Pigmented Sarcoma of the Choroid.—Dr. Cassius D. Wescott showed a patient whose history is as follows: In August, 1896, Goldie C., aged four, of Madison, Wis., was referred to him by Dr. H. B. Favill, of Chicago. After an attack of measles, when two-and-a-half years old, it was noticed that she could not see with the left eye, and "something white" could be seen in it. The child had made no complaint of pain until a short time before being brought to Dr. Wescott, and her general health seemed to be quite perfect. She had been under the treatment of a specialist in Madison for a year, but the nature of the treatment could not be learned, except that "drops" were put into the eye. On examination the right eye was found to be quite normal in every way. The left eyeball was evidently larger than its fellow, but the lids were normal. The conjunctiva was not inflamed, but it was slightly edematous, and the sub-conjunctival vessels, especially the veins, were fuller than normal. The cornea was normal, but the pupil was fully dilated and the iris pushed forward by the lens, which was almost in contact with the cornea. There was a yellowish reflex from the pupil as the eye was examined in an ordinary light, and the tension of the eyeball was +2. No pain was complained of at the time of the examination. The diagnosis was intra-ocular tumor, probably glioma of the retina, and the eye enucleated. Upon section of the eyeball, after hardening in formalin, the tumor was found apparently springing from the choroid in the region of the optic nerve head. It extended forward to the posterior surface of the lens, separating to some extent the choroid from the sclera, apparently infiltrating the choroid and retina in places as far forward as the ora serrata. Microscopical examination showed the tumor to be a small round-celled sarcoma, springing from the deeper layers of the choroid and infiltrating the retina and optic nerve. A section of the optic nerve at the point of amputation showed that the tumor cells had infiltrated the substance of the nerve beyond that point, and it was therefore expected that the tumor would return. In May, 1897, the patient returned with a new growth nearly filling the cavity of the orbit. It was immediately removed by complete exenteration of the orbit. Healing was prompt and uneventful, but in August of the same year the growth had again returned. Further operative procedure was advised against, and instead a trial of the erysipelas toxins was suggested, which was made by Doctor Van Hook, at the German Hospital, but the treatment was without avail and the patient died December 27, 1897, with symptoms of brain tumor.

No autopsy could be obtained. This case is of interest chiefly because of the rarity of this form of tumor as compared with glioma of the retina.

Primary Carcinoma of the Conjunctiva in a man, a farmer by occupation, sixty-four years of age, who had enjoyed good health until within the last year, since when he has been rather feeble and somewhat demented. Five or six years ago a small tumor was removed from his face, which was called a cancer. Between two and three years ago the present trouble began as a spot of redness upon the upper and outer part of the eyeball. The spot soon assumed the form of a pimple, and continued to grow much more rapidly during the last few months. The right eye was normal; the lids of the left eye were normal, but it was impossible to close them because of the presence of a somewhat lobulated tumor, projecting over the cornea. The eye and tumor were bathed in a muco-purulent discharge, and the apex of the tumor was apparently beginning to slough. The tumor was unpigmented and covered by a thin, membranous, transparent capsule, beneath which a few large vessels were easily seen. Immediate enucleation was advised, and consented to. The operation was performed without difficulty, but was very bloody. The retrobulbar conjunctiva above was involved in the tumor, and was removed. The tumor was otherwise limited to the globe, and no secondary growth was found in the orbit, and the neighboring glands did not seem to be involved. Upon examination of the specimen the eyeball seemed to be normal and the cornea clear, the tumor evidently growing from the conjunctiva upward and outward from the limbus. At the thickest point the tumor was 1 cm. in thickness, somewhat oval in shape, perhaps 2 cm. wide and 2½ cm. long. Microscopical examination of the tumor was made by Prof. Ludvig Hektoen, director of the laboratories at *Rush Medical College*. His report is as follows:

"The interior of the eye seems normal, also the optic nerve. The right antero-lateral quadrant of the globe is covered by an oval, concavo-convex growth, which appears to spring from the conjunctiva, to which it is attached throughout. The sclera and the cornea under the tumor are intact. The tumor overlaps the cornea to beyond the middle line, but there is no marked organic connection between the two. The tumor is 8 mm. thick, its longest diameters 2.5 and 2 cm. Its margins are rounded, in places a little lobulated. On the cut surfaces it presents a grayish-white, almost homogeneous appearance; a few small blood-vessels are recognizable. Microscopical examination shows that the tumor springs from the epithelium of the scleral conjunctiva. The sub-conjunctival tissue, the sclera and the cornea are intact. The tumor

consists of huge branching masses and columns of epithelial cells, separated by a vascular fibrous tissue in which there is an abundant round-cell infiltration and a few hemorrhages. The epithelial cells are in the main large and flat; at the periphery of the masses the cells at times assume a short columnal outline. The nuclei often lie in vacuoles in the clear protoplasm, which may have a narrow, dense hyaline border. A few atypical horny masses are met with. The diagnosis is Carcinoma of the Scleral Conjunctiva."

Multiple Lymphoid Tumors of the Orbits in a man about fifty years old, a grocer by occupation, who complained of failing sight in consequence of tumors about the eyeballs, had been steadily increasing in size and number for some months, during which time he had also failed in general health and had lost over fifty pounds in weight. The lids of both eyes were normal, except that they were bulged forward, owing to the presence of firm and somewhat nodular tumors beneath them. The cornea and iris were normal in both eyes and the media clear, and when the lids were raised by the fingers vision was good, but the presence of the tumors made it impossible for the patient to raise either of the upper lids fully above the pupils. The conjunctiva was not inflamed, but its vessels, especially the veins, were much fulled and larger than normal. The diagnosis of multiple sarcoma was made and concurred in by Prof. F. C. Hotz, and the patient advised that operation was not feasible. His son was informed that the patient would probably live a comparatively short time, as it was reasonable to suppose that similar malignant tumors probably existed in some of the internal organs. The patient returned in about three months with closure of the lids, and insisted upon an operation even if he could be given sight for only a few weeks. After explaining again the probable malignant nature of the disease, and his acceptance of the situation, the tumors were removed. The largest of the number was removed from the upper and outer portion of the right orbit, through an incision over 1½ inches long through the lid just below the brow. All of the other tumors were removed through the conjunctiva. They varied in size, when fresh, from that of a small dried pea to the first joint of my thumb. He lived a year and a half, and died from progressive anemia, without having any return of the tumors. Microscopical examination of one of the tumors, made a few days after the operation, seemed to confirm the first opinion that the tumors were sarcomata. However, as the patient continued to live on without return of the growth, the pathologist changed his verdict, and the tumors were pronounced lymphomata.

Sub-conjunctival Dislocation of the Crystalline Lens in a farmer, who stated that five days before, while attending his cattle, a young cow had hooked

him in the eye. His family physician had told him that the eye was destroyed, and sent him to the city for its removal. A large, ragged wound was seen in the sclera, below and a little to the nasal side of the cornea. The anterior chamber was occupied by a blood clot, and the iris could not be seen. The cornea was intact, but hazy; the wound was closed by a plug composed of blood clot and lymph. The globe was soft. The eye was easily enucleated. There was no other wound in the sclera, the horn having pierced the anterior wall of the globe only. The specimen was put in alcohol, where it remained undisturbed for three or four weeks. Upon bisecting it, the crystalline lens was found encysted outside of the sclera, and that, in making the section, it had been divided. It had evidently escaped from the scleral wound, slipped back between the ocular conjunctiva and the globe, and become encapsulated in a mass of inflammatory exudate.

MEETING OF THE BERLIN OPHTHALMOLOGICAL SOCIETY.

MEETING JANUARY 28, 1898.

Translated and abstracted from the Ophthalmologische Klinik, March 5, 1898.

BY H. V. WÜRDEMANN, M.D.

OF MILWAUKEE, WIS.

Kuthe. Practical Treatment of Keratomalacia in Infants. Has seen twenty-six cases of keratomalacia within four and a half years from 34,000 cases in Hirschberg's clinic. The treatment comprises that of the general condition; daily applications of collodion-cotton dressings and physiologic salt solution. The collodion bandage is recommended, as it remains perfectly in apposition with the eye and prevents too quick evaporation of the dressing. A considerable number of cases heal with entire closure of the pupil, which should be operated upon early in order to prevent increase of intra-ocular pressure and to make a visual opening which favors development of the retina. Canthotomy is to be done before the intra-ocular operation. He showed a case which had been under treatment.

Spiro. The Effect of Mydriatics and Myotics in Paralysis of the Pupil. Examination into the clinical aspect of the effects of mydriatics and myotics is accompanied with difficulties on account of the great differences of opinion in regard to the anatomic and physiologic basis. S. compares the latest reports upon the structure of the ciliary ganglion and alludes to the recent report of Schulz in the Berliner Ophthalmological Society concerning his experimental and physiological studies. At the request of Hirschberg, S. had systematically proved the work of Schulz regarding the effect of atropin and eserin in this clinic. He experi-

mented upon twelve cases of total paralysis of the oculo-motor nerve in which paralysis of the pupil and accommodation was complete. The paralysis was mostly of recent origin. A few cases dated back as far as six years. In these atropin widened the enlarged pupil from 1 to 1½ mm. S. does not think that this means irritation of the sympathetic, but further paralysis of the not yet fully paralyzed nerve ends, as ascribed by Schulz. Eserin causes maximum contraction of the pupil after ten minutes. This completely contradicts the views formerly held regarding any effect upon the cerebrum. Whether eserin, as has been recently shown by Schulz, acts exactly opposite to atropin upon the nerve ends or affects the sphincter could not be explained by these clinical experiments. It is of interest that, in old cases of complete pupil paralysis, light caused some further contraction of the pupil. In these experiments 1 drop of a freshly prepared 1 per cent. solution of atropin, or 1 drop of a 2-3 per cent. solution of eserin salicylate was used. Further clinical experiments upon this subject are now going on in Hirschberg's clinic.

Hamburger showed a case *from Hirschberg's clinic of a 20-year-old man, who had previously been healthy, who lost vision after inflammation of the lungs.* The left eye, after a few weeks, became entirely blind, and the right lost considerable vision in a few months. Examination showed that there was atrophy of the optic nerve in the left eye, and in the right choked disk, with defect of the lateral visual field immediately under the fixation point. Diagnosis was made of tumor of the optic chiasm with entire destruction of the left nerve and interruption of some of the nerve bundles of the right, which proceed to the center of the right retina. The lateral nerve fibers of the right optic nerve remained intact.

Fehr spoke upon *Relaxation of the Eyelids, the so-called Blepharochalasis.*

Mendel showed a case from Hirschberg's clinic, in which *a splinter of copper had remained 5 years in the lens* without causing any irritation, and the eye had retained full vision.

Editors of the Ophthalmic Record.

Dear Sirs: In the report of the discussion on my paper, "*The Antiseptic preparation of the conjunctiva for cutting operations on the eye ball,*" read before the Western Ophthalmologic and Oto-laryngologic Association, I find my closing remarks in reply to my friend Dr. Knapp's discussion are incorrectly given. I stated as follows: "That I had probably seen as many of Dr. Knapp's cataract operations as any one—that they are simply perfection, and that his technique could not be in any way responsible for the case he mentioned."

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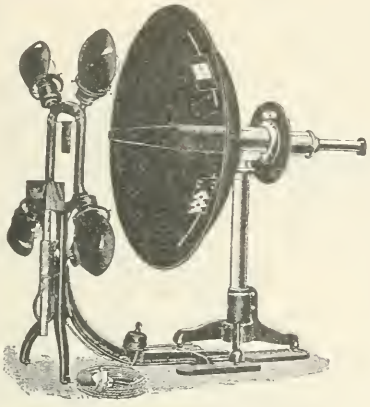

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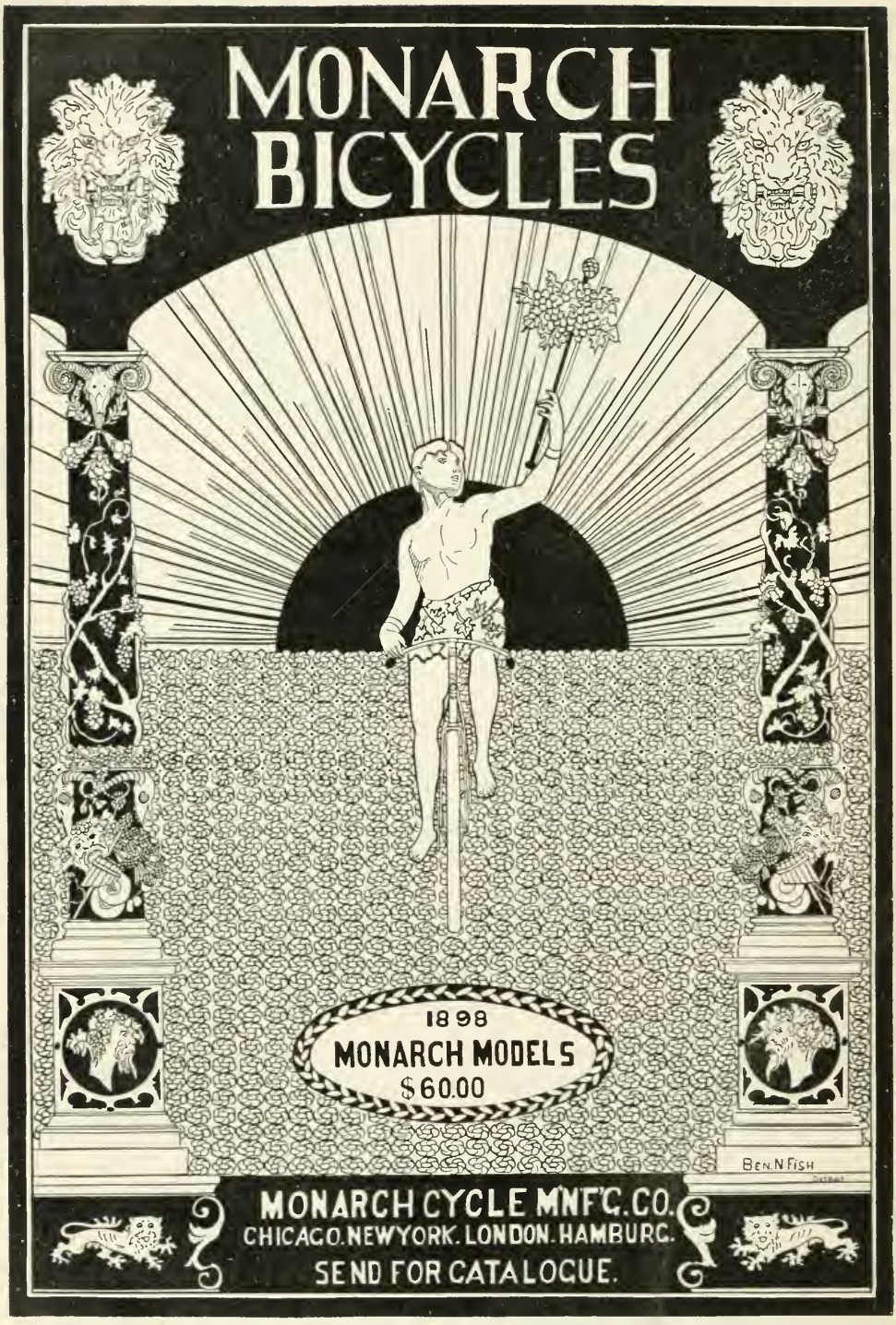
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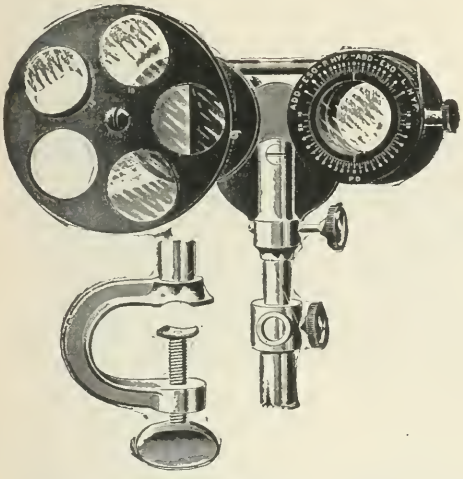

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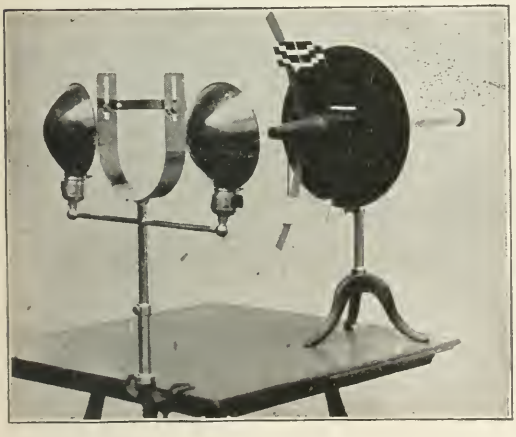

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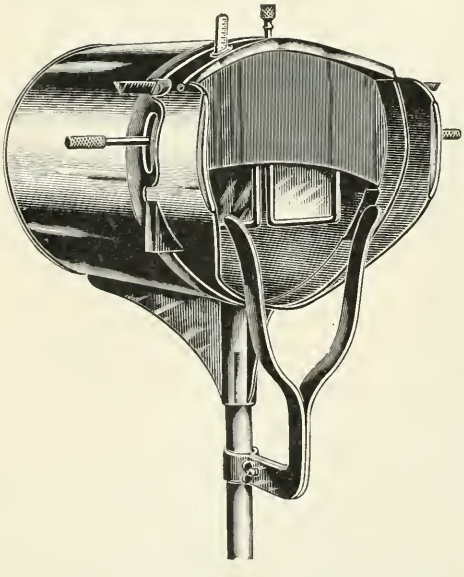

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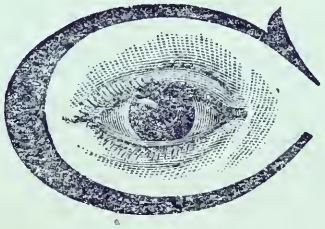
TRADE  MARK

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